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Full-Time Rural Health Service

JOHN A. FERRELL

The Control of Lobar Pneumonia

FRANK L. HORSFALL, JR.

The Venereal Disease Problem

GORDON BATES

Zinc Sulphate in Poliomyelitis

R. STERLING PENTECOST

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Full-Time Rural Health Service*

JOHN A. FERRELL, M.D., DR. P.H.

Associate Director of the International Health Division of the Rockefeller Foundation, and Chairman of the Executive Board of the American Public Health Association, New York City

THE developments in the field of public health during the past twenty to twenty-five years have been striking. The movement has included the employment of full-time health workers for province, state, city, municipality, county, and district. The school of experience—the only reliance in the beginning for training personnel—has been supplemented and strengthened by university schools that have assembled the best of knowledge, theory, and experience as a basis for training public health personnel. Appropriations for health purposes have been made by national, provincial, and local governments in increasing amounts. To be sure, the amounts are far from adequate, but it is significant that a beginning has been made. Public appreciation of the necessity for, and the value of, community health service is observable to some degree at least in most communities, but the job yet to be done in this direction is monumental.

There are many common factors in the development of health service for the various governmental jurisdictions, but the structure of the organization has to be adapted to the character of service to be rendered. The rural district presents the greatest problem, mainly for economic reasons. Funds are not available for employing the needed specialized or technical workers. The work of necessity is on a generalized basis and the cost of each item of service, because of the distance between homes, is high, while the number of services that can be supplied is limited. The central jurisdiction (state or province) can aid in supplying the specialized services (laboratory, sanitary engineering, epidemiology, and specialists for specific diseases or problems), but this can never equal what the city with its concentration of wealth and population can afford in both specialized and generalized services.

*Presented before the Social Hygiene Section at the Twenty-sixth Annual Meeting of the Canadian Public Health Association, Ottawa, June, 1937.

However, even in the case of the rural areas we can look back and find that much progress has been made. The trend, generally speaking, is in the direction of a public appreciation of preventive measures, more reasonable financial support, the enforcement of qualification standards for new personnel, and the merit rather than the political basis in the filling of vacancies. There is no claim that the exceptions to these sound principles are rare. Much time will be required before the transition will approach completion, and in the meantime many able and trained workers will be sacrificed on the altar of politics, ignorance, greed, and graft.

A description of the usual rural health organization, its budget, sources of funds, program of activities, and achievements is hardly warranted here. Such data have been published in your journal. Those who have yet to learn about these activities will do well to visit soundly established rural health units and make firsthand observations.

As a result, in part at least, of public health activities, death rates and sickness rates have fallen considerably during the past two decades. In communities which have had creditable health organizations for several years, deaths from typhoid fever, diphtheria, and smallpox have become extremely rare and the tuberculosis rate has fallen to a marked degree. In many other directions, through the application of knowledge by effective methods, life and health are being safeguarded. This progress has been made by the experimental approach. Many trial procedures have been made. Some of them were failures or at least not highly satisfactory. The satisfactory ones have been preserved and combined into so-called approved or established activities. Thus by the trial and error approach, sound practices have shown striking growth in both quality and quantity.

The knowledge necessary for effectively combating a number of important diseases, such as infantile paralysis, encephalitis, and cancer, is not yet available. But progress in their study is being made. The scope of the public health field is widening. For example, the knowledge as to pneumonia and methods for its treatment has been advanced to a point that warrants the organization of state and community facilities by the medical and health forces for fighting the disease. Five state departments of health are already producing and distributing antipneumococcic sera and are operating laboratories equipped to diagnose promptly the various types of pneumonia. The recent discoveries with respect to influenza are likewise promising as to control possibilities. Syphilis and gonorrhea as public health problems have been brought out of hiding and are taking their places in health programs and in the news columns along with other important communicable and preventable diseases. Schools of public health for training health officers, public health nurses, sanitary engineers, epidemiologists, bacteriologists, serologists, sanitary chemists, statisticians, and other groups of public health workers have been established and are now operating at full capacity.

In view of these developments, the question will naturally arise as to whether or not the public health movement has expanded as far as it should go.

Has it reached full maturity or is it still in a young and growing stage? If it is merely well started—and I believe this to be the case—what are some of the pressing problems awaiting solution other than those relating to the utilization of existing knowledge and the discovery of new knowledge as to the causes and modes of spread of specific diseases and methods for the control of these diseases?

The effective application of the knowledge now available to the protection of the health of the masses, notwithstanding the progress made, is still unsatisfactory in a number of particulars. Much more can be done along the conventional lines at present being followed, but certain of the more fundamental deficiencies relate to general policies in state and local government. Defects in our systems of government need correction. Public employees in all classes of service and at all levels should be trained for the duties they are to perform, and they should be appointed, compensated, and retained in service on a merit basis and not be subjected to the uncertainty as to these features which characterizes the political spoils system. This principle should apply to premiers, governors, mayors, boards of supervisors, and administrators of county or municipal business, to the highest as well as the lowest positions. Under present conditions a newly elected executive all too often comes into office inadequately informed and otherwise quite unprepared for the many responsibilities and duties that devolve upon him. By the time he has learned enough to function effectively his term of office may end and the community's business suffers while his successor is training at public expense for his job. The health department and the services it endeavours to render as a result are impaired. This is likewise true of the other essential public services. The period preceding and following the elections involves uncertainty for the employees. Their work is inevitably slowed up. The correction of the present system of public administration is of pressing concern to the whole community and to its employees. Efficiency and stability in the public business of the community call for a change in the system that will insure the employment of a trained business administrator selected, retained, and compensated on a basis of competency, training, and experience. The situation is of deep interest to the health workers, but its correction cannot be brought about by a single service. As a matter of fact, experiments to determine the advantages to be derived by employing city and county managers are being made in many places with encouraging results. Should not the experimental solution of this problem of inefficiency in public administration be undertaken by the states and communities with the full and enthusiastic support of all their branches of service?

Another community problem which is of concern to the health department, whether urban or rural, relates to the lack of co-operation and co-ordination between the various essential services of the community which operate in the fields of education, social welfare, and public health. A number of community problems do not fall entirely within a single field. Tuberculosis and syphilis are examples. These diseases are communicable and endanger the life and health of well persons. Consequently, they are of vital concern to the health department. They may strike down the bread-winner of the family. Then

poverty results and the necessity for public relief in the form of food and medical care. Thus the social welfare service has to share in dealing with the problems caused by syphilis and tuberculosis. In teaching children hygiene and methods of protection against these and other diseases, the schools have a rôle to play. Moreover, in the health services conducted for preschool children and those in the lower grades, the education department has a large and real interest. Other health problems such as nutrition and mental hygiene likewise deeply concern all the community services, and conversely, problems mainly in the education or welfare services present public health aspects.

These inter-relationships are mentioned here merely to emphasize what you of course already know, namely that the community is or should be regarded as a unit. Programs for dealing with its various problems should be planned wisely and with detachment for the whole community by qualified persons. They can then be broken up and each service can undertake to deal with that part of the work for which it is best fitted. This scheme calls for team play and for co-ordinated effort between the various services, and in its execution the trained public administrator should exercise leadership, guidance, and stimulation. Here again by the experimental approach is offered opportunity for finding a practicable and effective method for dealing with an urgent community problem.

Finally, just one other vital subject in community life, both rural and urban, will be mentioned. While of interest to the health workers, it is likewise of equal interest to other branches of service as well as to the community as a whole. I refer to the economic status of the community and of the individual families of which it is composed. The character of the community will be determined by the people. If they are restricted to a very low economic level their living quarters will not be conducive to good health. If the quantity, quality, and variety of foods are inadequate, they will be poorly nourished. As a result, their mental and physical condition will fall below normal and they will more readily succumb to disease. Likewise, there will result subnormal mental and physical efficiency. If they are economically unable to live decently they cannot finance the community services designed to insure health, development, and a normal existence. The expenditures for the education of the children will involve considerable waste if the pupils are sick or below normal in health.

These gloomy observations are intended to emphasize the importance of having community leadership to guide the families of the community into vocational activities which will insure a reasonable income and reasonable standards of living. While the possibilities of economic attainment will vary with communities, something can be done in every community to aid all healthy adults in finding employment that in turn will enable them to secure the necessities, and usually something above the bare necessities, of life.

In summary, it may be said that the forward march of public health in the past twenty years has been notable; that no really progressive community now fails to have a health department staffed with full-time trained health workers

consisting of health officer, public health nurses, and sanitation officers; that death rates from preventable diseases have been greatly reduced; that the scope of the public health field is steadily broadening to keep pace with the advance of scientific knowledge; and that schools for training public health personnel have been established and are operating at capacity. The methods for operating a health service efficiently have been demonstrated, and the nation-wide extension of health service is under way. These developments arrived at by the experimental approach are gratifying, but a careful examination into the present status of public health will reveal a number of fundamental weaknesses some of the most important of which concern the community as a whole. Chief among these is the instability and inefficiency of community government due to the current political system which fails in many localities to provide for the employment and retention on a merit basis of trained personnel to conduct the business of the community. This type of thing may prevail down the line throughout the special services and retard progress in every direction, including health conservation. The leadership of trained executives, when available and utilized, can through sound procedures and careful planning and experimenting conserve the community's economic resources and gradually raise the economic level to a point where the people can live well and enjoy adequate community services. Such leadership too can secure the co-operation among the education, health, and welfare services that is absolutely essential for dealing effectively with community problems.

The Control of Lobar Pneumonia*

FRANK L. HORSFALL, JR., M.D.

The Hospital of the Rockefeller Institute for Medical Research, New York

BEFORE entering into the detailed study of any problem it is well to consider the significance of the questions it raises, the present state of knowledge concerning answers to these questions, and the possibilities of progressing further with those for which there are now no answers.

Lobar pneumonia has been recognized as an important problem in human survival from the earliest recorded medical observations to our own time. It is now known to be the cause of more deaths than result from any other acute infectious disease. As a cause of death, lobar pneumonia ranks ahead of tuberculosis, and only cancer and the chronic degenerative disorders, cardiac disease and renal disease, are the cause of more deaths. It is hardly necessary therefore to emphasize additionally the importance of lobar pneumonia as a problem in the health of the general population.

In Canada lobar pneumonia has had a mortality rate of approximately 70 per 100,000 of population during the past few years. This means that each year at least 7,000 Canadians die of lobar pneumonia. Immediately these questions arise in our minds: is this heavy yearly toll from one acute infectious disease unavoidable? is there sufficient knowledge of this disease to indicate the use of specific measures which could significantly reduce this high mortality rate? and, finally, can these measures be reasonably applied? These questions we will attempt to answer.

ARE SPECIFIC MEASURES OF CONTROL NOW POSSIBLE?

For many years it has been assumed, on no very definite evidence, that lobar pneumonia followed upon many predisposing causes. Inclement weather, insufficient clothing, over-indulgence in alcohol, and chilling of various skin surfaces have all been blamed for the final pulmonary consolidation. Even if one or all of these factors could definitely be shown to be causally related to the development of the acute specific disease, lobar pneumonia, it is doubtful that any amount of effort by public health authorities could alter the frequency of their occurrence. It is equally uncertain whether control of these factors would change the incidence of the disease under consideration.

For a long time it has been recognized that lobar pneumonia is rarely a primary disease and that usually it is preceded by some degree of infection of the upper respiratory tract. These infections are of a varied character and an equally variable severity. The preceding upper respiratory infection may be simply mild coryza, any of the varieties of the common cold, the more severe

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upper respiratory infections such as acute laryngitis, tracheitis, or bronchitis and either endemic or epidemic influenza. This latter fact was quite clearly manifest during the influenza pandemic of 1918-19, and again in the much milder but quite definite epidemic of 1937. During both these periods the frequency of lobar pneumonia increased markedly. A study of the records of all cases of lobar pneumonia admitted to the Hospital of the Rockefeller Institute in the past twenty-five years has shown that some form of acute upper respiratory infection preceded the onset of pneumonia in 60 per cent. of cases. It seems probable on the basis of the experience of the past few years that had this possibility been more carefully investigated, the actual percentage would have been considerably higher.

It is now known as a result of the studies of Dochez and his collaborators that certain at least of the various symptom-complexes termed the "common cold" are caused by a filterable virus. The investigations of Laidlaw and Andrewes and subsequently those of Francis and Magill have resulted in the demonstration that inter-epidemic influenza also is due to another filterable virus. Although at present knowledge is not sufficient to permit of any plan of immunization against either the "common cold" or influenza, Francis has shown that human volunteers can be successfully vaccinated with influenza virus and that protective antibodies subsequently appear in their sera. Although these investigations are still in the experimental stage, they indicate a definite step forward and it seems not too much to anticipate that at some future date it may be possible to immunize specifically against both these conditions and it is to be hoped that this will be followed by a reduction in their frequency. However, all this must be left for the future.

The possibility of actively immunizing against pneumococci themselves has been entertained and a considerable amount of work has been done on this subject.

During the World War, Cecil and Austin vaccinated a large number of soldiers and for the past few years immunization against various types of pneumococci has been attempted by Lister in South Africa. Felton has recently attempted to produce active immunity by injecting the capsular polysaccharide of pneumococcus in volunteers. Despite the extent of these investigations it is not yet possible to assess accurately the value of active immunization against pneumococci. Eventually it may be found that some such method will be most useful in the prevention of acute respiratory diseases.

VALUE OF ISOLATION OF CASES

In the meantime, what preventive measures are there which if properly applied will assist in reducing the frequency with which pneumonia occurs? The isolation of cases of lobar pneumonia seems to be the only procedure which has a sound scientific basis. The studies of Webster and others have demonstrated the great rarity with which either type I or type II pneumococci are found in the throats of normal persons and yet these two strains of pneumococci alone account for approximately 43 per cent. of deaths from lobar pneumonia.

The investigations of Smillie and those of Stillman have demonstrated that between 15 and 25 per cent. of persons in contact with patients suffering from type I or type II pneumonia become temporarily carriers of these virulent organisms. The only logical procedure therefore is to carry out the same isolation technique where cases of lobar pneumonia are concerned as is used for any of the other specific acute infectious diseases.

DEVELOPMENT OF TYPE-SPECIFIC ANTISERA

During the past twenty-four years lobar pneumonia has been actively and continuously studied in the Hospital of the Rockefeller Institute under the direction of Dr. Rufus Cole. During the past fifteen years numerous other institutions have also studied this disease intensively. As a result of all these efforts many new and significant facts have been brought to light and many of the original problems surrounding lobar pneumonia have been solved.

Following the initial isolation of the pneumococcus by Pasteur, and the demonstration by Fraenkel that it was the organism most commonly associated with lobar pneumonia, only a few developments of major significance occurred in the bacteriology of pneumonia until the discovery of type specificity by Neufeld. This keen investigator isolated a strain of virulent pneumococci which he designated as strain I, and which has now become generally recognized as type I. Somewhat later Neufeld isolated another strain and showed it to be quite different from the first strain. About ten years later this second strain was designated as type II by Dochez. From this beginning the isolation and differentiation of various strains continued until in 1930 Miss Georgia Cooper had established the existence of at least thirty distinct and different types of pneumococci. These are now given Roman numerals to distinguish them one from another. Types of pneumococci can be distinguished accurately only by means of their serological reactions and this fact is of very great importance for it is on the basis of their serological differentiation that most of the recent therapeutic developments in lobar pneumonia have been possible. Type specificity, that is, the capacity of an antiserum to react with the same type pneumococcus as was used in its production, and not to react with any other type of pneumococcus, was for many years a very puzzling phenomenon. It was not until Avery and Dochez discovered the "specific soluble substance" that any inkling as to the cause for type specificity was found. They discovered that in the filtrates from pneumococcus cultures, the blood, and even the urine, of patients suffering from lobar pneumonia, there was a substance which reacted with antipneumococcus serum and that this reaction was type specific. A short time after this Heidelberger and Avery succeeded in identifying this substance and found it to be a polysaccharide; that is, a sugar of high molecular weight. Subsequently they were able to show that the polysaccharides from various types of pneumococci were chemically different and distinct. Type specificity in this way was placed on a definite chemical basis. The polysaccharides which were the cause of type-specific reactions were known to occur only in the capsule of the pneumococcus and pneumococci which did not have capsular envelopes

or which had been deprived of their capsules did not give type-specific reactions. The capsular polysaccharides, however, were shown to be of far greater significance than merely to function as handles whereby to differentiate one pneumococcus from another for it was demonstrated that encapsulated pneumococci were virulent, that is, they were responsible for infection in animals and man, while non-encapsulated pneumococci were non-virulent and did not cause infection. The capsular polysaccharides therefore formed an essential portion of those pneumococci which were able during the establishment of parasitism to cause disease and finally death.

It was demonstrated by Avery, Chickering, Cole and Dochez, that type-specific antiserum would protect animals against millions of virulent pneumococci, whereas in certain animals a very few pneumococci would kill if no antiserum were given. This protective effect occurred only if the homologous antiserum were used, that is, serum produced by immunization with type I pneumococci protected only against infections with type I pneumococci and not against infections due to any other of the thirty types of pneumococci.

Since it was known that lobar pneumonia resulted from the presence of type-specific pneumococci in the consolidated lung and that the organisms not infrequently invaded the pleura and the blood stream, it seemed logical from the experimental results obtained in animals to assume that type-specific antiserum could cure lobar pneumonia in human beings. Type I pneumococcus, since it was the first type definitely isolated, had been subjected to extensive study. Antiserum against it could be produced by the immunization of horses, and large amounts of antiserum could be made available for study in this way. It was found that type I pneumococcus caused approximately 25 per cent. of human lobar pneumonia and that on the average one in three patients with type I pneumonia died. Type I pneumonia, therefore, afforded an excellent test case inasmuch as it was of frequent occurrence and was sufficiently severe to account for about a quarter of all deaths from lobar pneumonia.

USE OF TYPE-SPECIFIC SERA IN TREATMENT

In 1913, Rufus Cole and A. R. Dochez first used type I antipneumococcus horse serum in the treatment of type I lobar pneumonia. The results of their initial therapeutic trials were excellent, the acute symptoms and signs of the disease were rapidly overcome, the duration of the disease was markedly shortened and the mortality rate was strikingly reduced. Wherever the fundamental principles of specific serum therapy in lobar pneumonia have been strictly adhered to, the results have continued to be excellent. That is, wherever typing has been carefully and rapidly done and type-specific serum of proper potency has been given in adequate amounts, the therapeutic effectiveness of antiserum has been proved. In the twenty-four years which have elapsed since this beginning many thousands of cases of type I lobar pneumonia have been treated with type I antiserum and there is no longer any doubt as to its value. Although many attempts have been made to simplify the procedure and to reduce the

few essential technical details concerned, it has become increasingly apparent that there are no short-cuts, that the type of pneumococcus causing the pneumonia must be accurately determined, that antipneumococcus sera must be of high potency and should be directed against but a single type, that adequate amounts of serum must be given, and finally that no delay must be allowed in the institution of serum therapy. In the past few years it has been found useful to concentrate antisera but the increased concentration of antibody per unit volume of solution is by no means as great as has been imagined although by using concentrated serum somewhat smaller doses can be given. It must be emphasized that the total amount of antibody necessary remains the same whether serum is concentrated or is not. The excellent results obtained with type I have stimulated the extension of specific serum therapy to other types of pneumonia and it is now established that not only type I but also type V, type VII, and type VIII antisera are of very real value. Even in type II pneumonia, which excluding only type III is the most severe and fatal of all types, has been successfully treated with specific antiserum though it is true that the results are not as good as in the types already mentioned.

Since the initial trial of serum therapy a large number of non-specific measures have been tried in the treatment of lobar pneumonia. Various chemotherapeutic agents, a few drugs, certain vaccines and various other substances have enjoyed a brief but unwarranted vogue. None of these agents has been able consistently and effectively to alter the course of the disease. To assist in the specific serum therapy of pneumonia only a very few drugs are needed and these are directed towards the relief of certain special symptoms. The administration of oxygen has been found to be of value in severe cases when definite cyanosis is present.

It is natural to enquire, what exactly is meant when it is stated that specific antipneumococcus serum is effective in the treatment of lobar pneumonia? That statement can be made when it has been conclusively demonstrated that the use of serum materially shortens the duration of the disease and definitely reduces the mortality rate. These criteria have been completely fulfilled in the cases of the types designated above. But the injection of serum is not all that is required to control lobar pneumonia. The antiserum must be of the same type as is the infecting pneumococcus and the degree with which its effect is successful is inversely related to the duration of the disease at the time it is given. As an illustration, in 462 adult cases of type I pneumonia treated in the Hospital of the Rockefeller Institute, the mortality was but 4.8 per cent. in those cases treated during the first three days of the disease, while if treated on the fourth day or earlier the mortality was 8.2 per cent., on the fifth day or earlier 8.6 per cent., and after the fifth day 19.5 per cent. In a disease in which the mortality rate in cases not receiving serum averages quite constantly 30 per cent., these reductions in mortality are very striking and they indicate that specific antiserum, while most effective in the earlier days of the disease, has still a very real value in the later days of illness. Relatively the same facts are also true of types V, VII and VIII. In the case of type II it is essential that

antiserum be given at the earliest possible moment and in large amounts if the results are to be worthwhile.

Recently there has been developed a somewhat different type-specific serum for the treatment of lobar pneumonia. Whereas previously antipneumococcus sera were produced by horses, this latter serum has been obtained from immunized rabbits. Although the series of cases which has been treated so far is not large, it already appears to possess certain advantages over horse serum. There are a large number of theoretical reasons for thinking that rabbit antiserum may be somewhat more effective than horse antiserum. Perhaps the most important of these is the fact that the antibody in rabbit serum is considerably smaller than is the antibody in horse serum. As shown both by ultrafiltration and ultracentrifugation, the former is about one-fourth the size of the latter. It was therefore to be assumed that the rabbit antibody would penetrate into both the pulmonary lesion and into the pleura more readily than could the antibody from horse serum. It has been shown by Finland that the antibody contained in horse serum is demonstrable in pleural exudates after intravenous injection but if these were infected the homologous antibody was not found in the uncombined form. It has been possible to demonstrate both type I and type II antibodies from rabbit serum in homologously infected pleural exudates after its intravenous administration.

At the present time nine different types of antipneumococcus rabbit serum have been prepared and used with success. There is good reason to think that antisera can be prepared against any or all of the thirty types of pneumococci by the immunization of rabbits.

PROMPT TYPING OF PNEUMOCOCCUS ESSENTIAL

Since, if the best results of specific therapy are to be obtained, it is important to diagnose the presence of pneumonia as early as possible, one must stress the fact that usually when pneumonia is suspected it is present. If it is present a bacteriological diagnosis is far more important than a detailed clinical one for only through the former is it possible to establish the all-important type of pneumococcus. Usually a small specimen of sputum suffices and when properly done the diagnosis of the fact of pneumococcus infection as well as the differentiation of type can be made in a relatively few minutes. By the use of the Neufeld reaction it is possible to determine very rapidly the type of pneumococcus in a sputum specimen. A positive reaction consists of a marked swelling of the pneumococcus capsule and this occurs almost immediately after contact with homologous rabbit antiserum; that is, type I pneumococcus will show capsular swelling or "quellung" only in the presence of type I antiserum and not in any of the other twenty-nine type-specific antisera. By using this method the type of pneumococcus, whether it be type I or type XXX, can be directly determined in less than thirty minutes.

Although the accurate and rapid typing of pneumococci is a relatively simple procedure, it requires a certain technical training and in the best interests of

the successful approach to the problem of controlling lobar pneumonia it seems wisest that typing be done in laboratories routinely equipped for the purpose. With these laboratories properly distributed and with an efficient system whereby specimens could be transported to them, the typing of any case should not occupy more than a few hours.

When the type has been determined specific serum therapy should be commenced at the earliest possible moment. In order that this be accomplished it is important that the physician be able to acquire antiserum without unnecessary delay and if this is to be possible an efficient distributing system is essential. It would prove useful to store antiserum in the various typing laboratories mentioned previously and upon the diagnosis of type the proper specific serum could then be transported directly to the physician.

SERUM REACTIONS

So far this discussion has been entirely confined to the desirable effects to be obtained from the proper use of type-specific antipneumococcus serum. In order to present a well-rounded summary, however, it is of some importance to discuss any undesirable effects which are or are held to be inherent in this therapeutic measure. These can best be summarized under three headings: chill reactions, anaphylactoid reactions, and serum sickness.

Chill reactions have never been a serious drawback to the use of antiserum even though, in the early days of serum therapy, they occurred with considerable frequency. Although unpleasant, these thermal reactions are not dangerous and since the introduction of concentrated antiserum their incidence has been very considerably reduced. Recent reports vary somewhat though on the average they occur in from 10-20 per cent. of cases.

The fear of anaphylactoid reactions has been in the minds of some a deterrent to the general use of antiserum. It is true that a certain very small percentage of patients are sensitive to horse serum, but the fact of their sensitiveness can be easily detected by means of simple preliminary tests. It has been the routine practice of those administering antiserum to use conjunctival and skin tests before beginning the therapeutic injection of serum. If these tests are negative, if the initial injection of serum is begun slowly, and if epinephrine is at hand and is used immediately upon the development of untoward symptoms there is almost no reason to expect or to fear a serious reaction.

Another objection to the use of antiserum is the subsequent development of a train of symptoms termed serum sickness. Concentrated serum has reduced the incidence of this condition somewhat but it still occurs in from 25-50 per cent. of cases, depending to some extent upon the amounts of antiserum injected. Serum sickness is really a rather unimportant sequel to serum therapy and is never serious. A day or so of transient urticaria, arthralgia and slight fever is a very small price for the cure of a severe acute infectious disease which carries, when untreated, a mortality rate of 30 per cent.

RESULTS OF SPECIFIC TREATMENT

Assume for a moment that the administrative and economic difficulties arising from a system of this kind have been overcome. One has a perfect right to enquire, what results are to be anticipated and by how much will these measures reduce the present appalling mortality from lobar pneumonia?

These questions can best be answered by a statistical analysis of lobar pneumonia and the results obtained with specific serum therapy.

In the United States in recent years there have been on the average 100,000 deaths from lobar pneumonia per year. It is known that lobar pneumonia, when all types are taken into account, has an average mortality of 32.2 per cent. On this basis one can calculate that there occurred in the United States registration area 311,000 cases of lobar pneumonia. From this it can be calculated on the known percentage distribution of types that there were 80,850 type I, 34,200 type II, 24,900 type V, 18,650 type VII and 21,800 type VIII cases, all of which are known to respond to serum therapy. This forms a total of 180,400 cases which may be treated with serum. Therefore 58 per cent. of all cases of lobar pneumonia in the United States could have been treated had five type-specific sera been available.

Because of the now well known mortality rates for each of the various types, it can be calculated that of the 180,400 cases due to these five types, 57,400 were fatal and this figure amounts to 57.4 per cent. of the total mortality.

By the administration of type-specific antiserum it is known that a striking reduction in the mortality rate can be produced. On the average the five types indicated have, when not serum-treated, a mortality of 31 per cent. With adequate serum treatment it is conservative to state that the average mortality in this group can be reduced to 12 per cent. or less. This statement has as evidence various large series of cases recently reported by Bullowa, Finland, and others. Therefore, the mortality figures in cases due to these five types should have been at the most 21,900 had antiserum been properly used. Subtracting this from the 57,400 who did actually die, we arrive at the surprising total of 35,500 wholly unnecessary deaths from lobar pneumonia each year in the United States registration area. In other words there were twenty-seven deaths from lobar pneumonia per 100,000 of population which could have been prevented had the therapeutic measures now known to be effective been applied.

The incidence of the various types of pneumococcus pneumonia has been carefully studied in such widely separated regions as China, South Africa, England and the United States. From these investigations it can be concluded that the distribution of types of pneumonia in various parts of the world is fairly similar from one location to another. It seems fair to assume, therefore, that what holds for lobar pneumonia in the United States will also hold for it in Canada and therefore that the rate of unnecessary deaths from this disease in Canada is equal to that in the United States.

SUMMARY

In summary one may say that there is no longer any reason to doubt that the weight of evidence which has been carefully accumulated indicates definitely that many of the problems concerning the control of lobar pneumonia have been solved. In the light of what is now known the outlook for reducing the general mortality from this acute infectious disease is good if the principles underlying its control are understood and proper therapeutic measures are exactly applied.

There is much to be hoped for in the field of prevention and as accurate information is gathered and suitable preventive techniques are developed these should be incorporated into the general plan. Until that time cases of lobar pneumonia should be cared for under the usual infectious-disease isolation technique.

In the meantime there is a great deal to be gained from the proper use of good antiserum. As a beginning it seems wisest to restrict vigorous efforts to the control of type I and possibly type II pneumonia. Subsequently it may prove desirable to extend and enlarge the attack and then certain other types may well be included.

Too much must not be expected too soon and although the results obtained in individual cases will be good, and often even dramatic, it will require a great deal of time and effort to extend serum therapy sufficiently so as to significantly influence general mortality statistics. However, this probably can be done.

To accomplish the best results it seems worthwhile to recommend the following: (1) an extensive educational program for the instruction both of public health authorities and the practitioners of medicine, (2) the establishment of numerous easily accessible laboratories for diagnosing and typing cultures, (3) the production of antipneumococcus sera of maximum potency, (4) the arrangement of distribution centres for supplying antiserum, (5) the accurate recording of cases, contacts, and the results of serum therapy for subsequent study, (6) well-trained personnel and whole-hearted co-operation between health authorities and medical practitioners. By means of a carefully planned and adequately staffed organization as well as a properly managed campaign it seems certain that successful results can be obtained and that great benefit can accrue not only to individuals ill from this disease but also to the people as a whole.

The Venereal Disease Problem in Canada*

GORDON BATES, M.B.

General Director, Health League of Canada, Toronto

Medical Director, Special Treatment Clinic, Toronto General Hospital

THE problem of venereal disease was brought to public attention in Canada for the first time during the war. Three fundamental discoveries had recently been made which paved the way for a growing appreciation of the prevalence and seriousness of the venereal diseases, that of the spirochaeta pallida by Schaudinn in 1905 and that of the Wassermann reaction by Wassermann and of Salvarsan by Ehrlich during the next five years. The increasing use of the Wassermann reaction and the resultant discoveries as to the prevalence of syphilis and its relationship to serious end results were probably responsible for the action of Sir William Osler, Sir Clifford Albutt and other distinguished British physicians in urging governmental action in England. The Report of the Royal Commission on Venereal Diseases, which sat under the presidency of Lord Sydenham from 1913 to 1916, had a great deal to do with calling public attention to the matter not only in Great Britain but throughout the world.

The war, coming at a time when more attention was being paid to the necessity for preventing communicable disease among troops, had the effect of making it possible to "count" venereal cases for perhaps the first time in history. The decision having been made to segregate and keep venereal cases out of the ranks, armies all over the world found themselves confronted with a major problem. Many thousands of men were non-combatant and in hospitals at the expense of the country when they were badly needed in the trenches. It was realized that, coming from civil life, they were only part of a great disease problem which permeated all of society; that, uncared, for many of them would ultimately become unfit and occupants of institutions and a charge on society; that their lives would be cut short; that their disease would be passed on to their wives and their children.

In England in 1916 the British Royal Commission on Venereal Diseases recommended a plan calculated to deal with the question as a problem concerning the whole nation. As a result it was decided to encourage the working out of treatment schemes by all local health authorities by reimbursing such authorities to the extent of 75 per cent. of their expenditures out of Imperial funds. That education of the public is essential was recognized by the decision of the government to subsidize the British Social Hygiene Council as an educational body. The British scheme was eminently satisfactory.

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It lacked, however, what we in Canada feel to be essential—specific legislation dealing with the subject.

In Canada, in spite of our size and our organization into nine provinces, the problem was not unlike that of Great Britain. Public opinion had been aroused and when the Dominion Government called a Dominion-wide conference to discuss the question in 1919 it was decided to subsidize the provinces to the extent of \$200,000 annually for the purpose of venereal disease control on condition that the provinces contribute an equal amount. It was decided also to subsidize the Canadian Social Hygiene Council which undertook in Canada responsibilities similar to those of the British Social Hygiene Council in Great Britain.

FIRST DOMINION-WIDE PLAN OF CONTROL

The Canadian scheme was the first example of a Dominion-wide campaign against disease in which the Dominion Government and the provincial governments co-operated. Appropriately enough, it was inaugurated simultaneously with the establishment of the Dominion Department of Health under a Minister of Health.

With the development of this scheme, Canada began to think of health as a national responsibility. Already most of the provinces had passed considered legislation officially recognizing venereal disease as communicable and providing for notification and compulsory treatment. With the development of Dominion co-operation all participating provinces sprang into action. The educational phase carried on by means of moving-pictures, lectures and pamphlet distribution, and the co-operation of the press, was excellent. Clinics multiplied until, by 1932, 102 were in existence. In the fiscal year ending March 31, 1924, 369,016 clinical treatments were given in clinics. This number had increased by 1931 to 703,706—an indication not of an increased amount of venereal disease in Canada but of the fact that the Canadian plan was operating efficiently in that more persons who required treatment were presenting themselves for treatment.

Results

An interesting example of the results of the plan is provided by the record of routine Wassermann tests in the Toronto General Hospital since 1916, as follows:

	per cent.		per cent.
1916.....	10.4	1926.....	4.5
1917.....	9.95	1927.....	3.8
1918.....	5.9	1928.....	3.5
1919.....	8.8	1929.....	3.2
1920.....	9.0	1930.....	3.4
1921.....	6.3	1931.....	2.7
1922.....	6.0	1932.....	2.5
1923.....	6.2	1933.....	2.5
1924.....	5.6	1934.....	1.7
1925.....	5.8	1935.....	1.7

In the nearby Hospital for Sick Children the percentage of Wassermann tests, taken as a routine, which were positive fell from 5 per cent. to less than 1 per cent. In St. Michael's Hospital, Toronto, the percentage dropped to an average of 2.03 per cent. over the last five years, and in the Kingston General Hospital to 1.3 per cent. Similar statistics could probably be obtained from other parts of Canada.

Nor is there any indication of an increase in the late end results of syphilis, such as would be expected twenty years after the greatest war in history. In a recent statement prepared by the Department of Pensions and National Health it is stated that shortly after the war two reliable sources of information, one European and the other American, forecast that 2.5 per cent. to 4.5 per cent. of syphilitics would have developed tabes or general paralysis of the insane in twenty years from the date of initial infection but that as a matter of fact only 0.5 per cent. of known cases of syphilis in the army have developed either of these serious nervous system sequelae. Similarly there has been a marked decrease in congenital syphilis and in other end results such as heart disease of syphilitic origin. Apparently there is no evidence, however, that there has been any decrease in gonorrhoea.

I believe that I am correct in saying that up to 1931-2, in spite of any deficiencies which may be demonstrated, Canada led the world in the field of venereal disease control. The Canadian scheme included all the factors necessary in a co-ordinated plan. The Dominion Department had a venereal disease division for inspection and consultation. The Dominion Government and all the provinces were contributing and co-operating. Voluntary effort was encouraged and given every scope. The importance of legislation and social work was recognized. The results were evident in the hundreds of thousands of treatments and in the reduction of syphilis in hospitals and other institutions.

CONFERENCES OF CLINICIANS

Yet in spite of progress much needed to be done. The venereal diseases were still with us. There were still many cases of disability and many deaths. Apparently there had been no reduction in gonorrhoea. In the absence of a continuous campaign conditions were likely to become worse. There was no reason to believe that they would improve unless careful planning was undertaken for the future.

The need for further action was submitted to the Dominion Council of Health in 1930, and in 1931 under the leadership of Dr. Parney, who succeeded Dr. J. J. Heagerty as Chief of the Division of Venereal Disease Control, three important regional conferences of clinicians dealing with the various phases of venereal diseases were held in Edmonton, Montreal and Toronto.

It was very evident at each of these conferences that, while there was general satisfaction at the progress which had been made, much more energetic action was needed if the incidence of venereal diseases was to be cut to nearly the minimum, to the end that the country might avoid the enormous expense of caring for patients with serious end results who were still occupying needed

hospital beds. Even though their numbers had not increased to the extent which might have been expected after the war, the congenital syphilitic and the syphilitic insane were still with us and in women serious surgical operations due to gonorrhoea were still of frequent necessity. If it is a disgrace for a civilized community to tolerate even one case of typhoid fever and if it is true that a death from diphtheria should call for a coroner's inquest, because both of these diseases are preventable, it is equally true that the time should be close when no civilized community will tolerate preventable venereal disease.

FINDINGS OF THE CONFERENCE

It was because of this feeling that, at the three clinical conferences to which I have referred, a series of remarkable resolutions was passed. Some of the more important of these resolutions were submitted to the Dominion Council of Health in December, 1931. They read as follows.

EDUCATION OF THE PUBLIC

BE IT RESOLVED that we recommend that intensive venereal disease propaganda, by means of lectures, moving pictures, literature and public addresses, etc., be continued with a view to still further enlightening the public as to the extensive existence and the devastating effects of venereal disease. Furthermore, we are of the opinion that concerted action is necessary, not only to lower the incidence but even to control this public health menace.

BE IT RESOLVED that we agree that, with a view to making early treatment effective, appropriate posters should be prepared stating the hours during which the clinic is open for preventive treatment.

IMPROVED METHODS OF TREATMENT

Necessity of Adequate Discussion with Patients

BE IT RESOLVED that, with a view towards the encouragement of continuous attendance by venereal disease patients, great emphasis be placed upon the importance in educational value of the first interview between the clinician and his patient. This interview should be made the opportunity for full explanation of the disease, its communicability and dangers, and the need for continuous and faithful treatment for a specific period or periods. This would necessitate an increase in the number of clinicians at large clinics.

Arranging Clinic Hours for Preventive Treatment

BE IT RESOLVED that there is no doubt about the efficacy of early treatment (within eight hours after exposure) in lowering the incidence of venereal disease. We are of the opinion that the practice of administering early treatment should be instituted in all Canadian venereal disease clinics. To be practical this will necessitate keeping clinics open and adequately staffed, both early in the morning and late in the evening (8 a.m. to 12 midnight).

Record Form for Transients

BE IT RESOLVED that, in order to assure continued and intelligent treatment of venereal disease for patients who find it necessary to travel, an effort should be made to evolve a simple method whereby patients may be

provided with a form to be carried by them, upon which records be inscribed of past treatments, for the guidance of clinicians in other clinics they may visit.

Financial Assistance in Rural Areas

BE IT RESOLVED that these conferences realize the difficulty involved in the effective treatment of indigents in rural areas suffering from venereal disease and therefore urge all provincial departments of health to enter into financial arrangements with local authorities, in order that the continuous treatment of these cases may be assured.

Facilities for New "Fever Treatment"

BE IT RESOLVED that facilities for giving the recently introduced "fever treatment" for general paralysis of the insane be provided in all large general hospitals with the idea of thus preventing many cases from ultimately becoming public charges in mental hospitals.

Hospital Beds for Patients with Gonorrhoea

BE IT RESOLVED that we recommend that every large clinic have a certain number of beds available for the accommodation of its gonorrhoea patients.

Remuneration of Clinic Physicians

WHEREAS the great and increasing volume of work carried on in venereal disease clinics has been undertaken in the past largely by physicians with special knowledge who have given their services gratuitously, and

WHEREAS to demand continuous gratuitous services from these physicians is unfair to the physicians in question and in the nature of exploitation, and

WHEREAS other countries have agreed upon a reasonable remuneration based upon the time spent in the clinic for physicians undertaking this service,

THEREFORE BE IT RESOLVED that we go on record urging that remuneration be provided for all physicians serving in venereal disease clinics.

Diagnosis by Central Provincial Laboratories

BE IT RESOLVED that we are of the opinion that both from the standpoint of efficacy and economy, central provincial laboratories adequately staffed by experts, where tests can be made for syphilis and gonorrhoea, should be established in preference to several small ones.

Facilities for Dark-field Examination

BE IT RESOLVED that all venereal disease clinics should be equipped with dark-field apparatus, and that hospitals with venereal disease clinics not providing this service should be instructed to do so.

Need for Tests of Spinal Fluid

BE IT RESOLVED that, in view of the findings brought forward at this meeting that the Wassermann or the Kahn test of blood is no criterion of the presence or absence of neuro-syphilis and in view of the good results ensuing from early recognition and treatment of the condition, we recommend that a spinal fluid examination should be carried out in each case of syphilis. In primary and early secondary cases we recommend that the spinal puncture be done at the end of intensive treatment and in all other cases at the time of the first examination.

PROFESSIONAL EDUCATION

As Relating to Gonorrhoea

BE IT RESOLVED that we are of the opinion that the teaching in our medical schools should be improved and extended with regard to gonorrhoea, as an ever-increasing number of patients are attending genito-urinary clinics showing the effects of maltreatment of this disease.

As Relating to Syphilis

BE IT RESOLVED that similar facilities for the improved teaching of syphilis and research work in both syphilis and gonorrhoea be established and that special reference be made to dark-field examination.

Greater Emphasis on These Subjects

BE IT RESOLVED that the inclusion of specific questions in the subjects of gonorrhoea and syphilis in the annual examinations in medicine and surgery in the education of general practitioners going out to serve the public would be a distinct contribution in the campaign against venereal disease.

BE IT RESOLVED FURTHER that this conference request the Dominion Council of Health to take steps to have forwarded a specific request to all medical schools that such questions be included.

Programs of Medical Associations

BE IT RESOLVED that the various medical associations be asked to include papers on venereal diseases in their programs for meetings.

Annual Clinical Conferences

BE IT RESOLVED that it is desirable that a meeting of the clinicians in each province be held once a year, possibly in conjunction with the annual meeting of the provincial medical association, whereat, besides other matters, latest methods and information be discussed and where possible demonstrated.

BE IT RESOLVED FURTHER that inter-provincial meetings of venereal disease clinicians be held every three years.

Revision of Publication No. 23

BE IT RESOLVED that Publication No. 23 (a book issued by the Dominion Department of Health for the instruction of physicians) be revised and brought up to date by its original authors or a selected committee thereof, and that copies be forwarded not only to all venereal disease clinicians but to all practitioners in the Dominion, and that an arbitrary standard of cure for both diseases be formulated and included in said publication for the guidance of those general practitioners who are called upon only occasionally to treat those diseases.

It is not suggested that these resolutions cover everything which might have been done if venereal disease is to be finally controlled, but their perusal will convince one that here is a problem the solution of which demands careful thought and hard work all over Canada on the part of departments of health and physicians generally. Not only that, the arousing of public opinion and the attention of governments are essential if we are to abandon the traditional attitude which allows incipient disease to develop into serious disability requiring hospital care before we give it serious attention. This is decidedly a matter for co-operative action between the Dominion and the provinces.

At the December, 1931, conferences of the Dominion Health Council the following resolution was passed as a result of the findings of the three previous clinical conferences:

WHEREAS the venereal diseases are prevalent and widely distributed in Canada, and

WHEREAS the interest of the Government of Canada, through the Department of Pensions and National Health, indicated by money grants, publications and highly trained personnel, has been very helpful to the provinces of Canada in venereal disease control, and

WHEREAS three meetings of venereal disease specialists in eastern, western and central Canada have been held, and from these meetings have come resolutions deserving our most serious consideration;

THEREFORE BE IT RESOLVED that the Government of Canada be commended for what they have already done, and requested to increase their contribution so that

- (1) More clinics may be opened;
- (2) More personnel may be made available for services in these clinics;
- (3) Clinic personnel may be reasonably remunerated, especially by giving time and facilities for study and methods of treatment;
- (4) The hours of treatment in clinics be extended to provide morning and evening hours for early treatment and also that working people may obtain treatment in hours off duty;
- (5) Facilities may be provided for the treatment of infected persons (especially women and children) living in sparsely settled areas of the country;
- (6) The matter of reporting and following up venereal disease cases be given special attention;
- (7) The staff of the Department of Pensions and National Health engaged in venereal disease control be instructed to maintain and increase their efforts to assist the provinces in this connection:

FURTHER BE IT RESOLVED that provincial governments be urged to increase their grants for venereal disease control, to revise their venereal disease program in the direction of efficiency, economy and better administration of practical measures for venereal disease control:

AND ALSO BE IT RESOLVED that the teaching faculties of our medical schools should interest themselves to a greater extent in training students to this work.

WITHDRAWAL OF DOMINION GRANTS

In the face of these specific recommendations passed unanimously by accredited representatives of the provinces, in 1932 all grants to the provinces by the Dominion Government for the purpose of assisting in the control of venereal diseases were cancelled. The Division of Venereal Disease Control in the Dominion Department of Health was abolished and the grant to the Canadian Social Hygiene Council, the official voluntary association in this field, was withdrawn. The same year the Division of Child Welfare in the Dominion Department of Health was abolished. One is not surprised that

there was a general feeling of dismay. Apparently health was not a very important matter for Canada.

Since this time the grant to the Canadian Social Hygiene Council, now the Health League of Canada, has been partially restored and this year the Child Welfare Division is to be again an official part of the Dominion Department of Health.

It is pointed out that the abandonment of leadership in the field of venereal disease control by the Dominion Government in 1932 has had serious results. The proposals of the conferences of clinicians of 1931, endorsed by the Dominion Health Council, were all perfectly sound and essential if we were to get ahead with our job of definitely controlling venereal disease in Canada. There has been little action as a result of any of the suggestions of the clinical conferences. In most of them there has been no action whatever. There is now no Division of Venereal Diseases in the Dominion Department. Therefore the leadership for which it is natural to look has been lacking because there is no leader. The voluntary association, it is true, has managed to keep going although the withdrawal of the Dominion grant in 1932 might well have destroyed it altogether. As a matter of fact, during the period when the grants were entirely lacking, the Canadian Social Hygiene Council was responsible for the production of the educational venereal disease moving-picture, "Damaged Lives", which has since 1933 been shown in most of the English-speaking world as well as in foreign countries. The voluntary association is at present engaged in revising Publication No. 23, a document prepared for the education of the physician. When completed, this will be published by the Dominion Department of Health.

Education of the physician in the essentials of diagnosis and treatment is necessary and yet with this exception very little has been done about it. Various other recommendations of the conferences of clinicians have not been carried out. Fever treatment is not available in most hospitals. Length of clinic hours has not been increased as recommended. Most physicians in clinics are still working without adequate remuneration. I have heard no rumours of regional conferences of clinicians, nor of provincial conferences for that matter. Venereal disease propaganda and education have not been intensified as recommended, rather the reverse. Routine Wassermann tests in hospitals are the exception rather than the rule. There are many other recommendations which have not been carried out.

In spite of all which has been accomplished, the venereal disease control plan, unorganized as it is, has carried on to some extent because of its own momentum. Because there are clinics and laws, much continues to be done as a routine. But in the absence of vigorous leadership momentum slackens. We must ultimately go forward or go back. I suggest that we should go forward, that we should re-organize our original scheme with all its component parts, that we should re-establish Canada as a world leader in this most important phase of public health.

Zinc Sulphate as a Chemo-Prophylactic Agent in Epidemic Poliomyelitis

A NEW TECHNIQUE FOR THE APPLICATION TO THE OLFATORY AREA

R. STERLING PENTECOST, B.A., M.B., F.R.C.S.(C.)

Otolaryngologist, Toronto Western Hospital and Christie St. Hospital,
Toronto; Consulting Otolaryngologist, Department of Pensions
and National Health of Canada

THE recent experimental work of Sabin and Olitsky (1), Schultz and Gebhardt (2), and Armstrong and Harrison (3), with macacus rhesus monkeys, tended to show that the usual portal of entry of the virus of poliomyelitis in monkeys was through the olfactory nerves and bulbs. Their experiments showed that the application of picric acid-alum and other solutions to the olfactory area of the monkeys gave a high degree of protection against virus instilled in the nasal tract. Schultz and Gebhardt (4) tested various solutions and recommended that a 1 per cent. solution of zinc sulphate be tried in man because of the low toxicity and surprisingly high protective action in monkeys.

In the human subject the olfactory area cannot be reached as easily as in the monkey. In man the middle turbinate lies in close proximity to the nasal septum; its displacement is necessary to visualize the olfactory area. In the simple act of inhalation little of the inspired air enters the superior meatus of the nose. Similarly, fluids introduced by an atomizer rarely enter it. The cribiform plate and olfactory area is *terra incognita* to most physicians; to the rhinologist it is *terra interdicta*; in all intranasal operations, one scrupulously avoids it. Experience has demonstrated that operative interference in this area is frequently followed by fatal meningitis.

The author, anticipating that he might be requested to apply zinc sulphate, began early in July, 1937, a series of experiments to ascertain if possible the simplest, quickest, and safest method of introducing the solution into the superior meatus. The test solution used in these experiments was 2 per cent. Pontocaine. This was chosen because our experience with it in over one hundred intranasal operations had demonstrated its rapid anaesthetic properties and low toxicity. It was introduced into the nasal cavities in several ways. After the expiration of ten minutes the mucosa was palpated with a fine nasal probe and the areas of anaesthesia noted. We are indebted to several adults for their co-operation in these experiments.

EXPERIMENTAL RESULTS

Experiment 1

Solution introduced by spraying with an ordinary DeVilbiss atomizer.

Result: Middle and superior meatus unaffected.

Experiment 2

Solution introduced by spraying after preliminary shrinking of mucosa with 0.25 per cent. ephedrine solution.

Result: Middle meatus slightly affected, superior meatus unaffected.

Experiment 3

Patient placed in the dorsal recumbent position with head fully extended and solution introduced with an eyedropper.

Result: Superior meatus unaffected.

Experiment 4

Similar to no. 3 after preliminary shrinking of the mucosa with 0.25 per cent. ephedrine solution.

Result: Variable: slight anaesthesia of anterior portion of middle turbinate and adjacent mucosa of nasal septum, and sometimes of cribriform plate. When the latter was affected, the sense of smell was impaired.

Experiment 5

Solution sprayed from a no. 156 DeVilbiss atomizer with tip inserted well up in the olfactory cleft.

Result: Variable: anaesthesia of inner surface of anterior half of middle turbinate and adjacent septal mucosa; incomplete anaesthesia of cribriform plate; some impairment of olfactory sense.

Experiment 6

Patient in dorsal recumbent position with head fully extended; 0.5 cc. of solution introduced by means of a syringe and small cannula. The tip of the latter was placed directly on the cribriform plate.

Result: Anaesthesia of cribriform plate and complete anosmia, the latter persisting for five days.

These experiments suggested that the last method was the only one which gave assurance of the complete covering of the olfactory area in all cases. Was it a safe method to use with children without general anaesthetic? Our experience as a rhinologist taught us that the introduction of any rigid metal instrument into the superior meatus was a very delicate procedure. The slightest movement of the patient might cause a perforation of the cribriform plate with its sequela—meningitis. After further experimentation with various instruments, we finally chose an olive-tip catheter.

EXPERIENCE WITH ZINC SULPHATE IN THE 1937 POLIOMYELITIS EPIDEMIC

In the past three months the rhinologists of Toronto have been requested to spray several thousand children and adults with the no. 156 DeVilbiss atomizer, inserting the tip well up between the nasal septum and the middle turbinate,

i.e., in the olfactory cleft. It was suggested that 1 cc. of 1 per cent. zinc sulphate and 1 per cent. Pontocaine in normal saline be thus sprayed on the olfactory area. By repeated tests the writer found that to expel 1 cc. of the solution from the no. 156 atomizer required squeezing the bulb six to seven times. Using a pressure of 10 lbs. from a compressed air pump generating 50 lbs. pressure required from three to four seconds.

In order to determine if one spray completely covered the olfactory area, the sense of smell of approximately one hundred children eight years of age and older was tested before and five minutes after spraying. Odoriferous substances

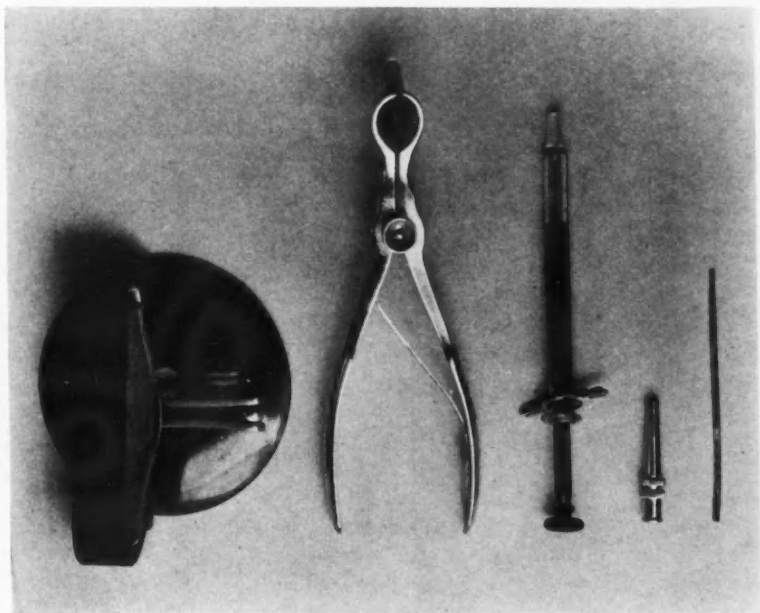


FIGURE 1.

familiar to them were used, viz., oil of bitter orange, peppermint, cloves, etc. We found that 76 per cent. were able to identify the substance by smelling after spraying, thus showing that at least part of the olfactory area was unaffected.

TECHNIQUE OF DIRECT APPLICATION TO OLFACTORY AREA

The instruments required are a head mirror, a nasal speculum, a 1 cc. syringe, and a 4" olive-tipped catheter in three sizes, no. 4 (French) for children under seven years of age, no. 5 for children seven to fourteen years, and no. 6 for those fourteen years and older.

The catheters used by the author were the x-ray-opaque ureteral catheters. We suggest that catheters of a similar size be specially manufactured for this purpose with one eye at the tip and impregnated with metallic particles sufficient to make them stiff enough for rapid introduction yet sufficiently flexible to avoid possible injury to the nasal structures (fig. 1).

The nasal mucous membranes are partially anaesthetized and shrunk by spraying the nose with an ordinary atomizer containing 0.25 per cent. Pontocaine and 0.25 per cent. ephedrine solution. This is done by a nurse or an attendant five minutes prior to the application. The patient is placed in the dorsal recumbent position with the head extended so that a line drawn from the external auditory meatus to the chin is in a vertical plane. The syringe is filled with 0.5 cc. of the solution and attached to the catheter by means of a ureter catheter adapter. The olive tip of the catheter is inserted between the upper third of the middle turbinate and the nasal septum for a distance of about one-half inch. The solution is thus expelled directly on the olfactory area. The head is maintained in the extended position for approximately one minute (fig.



FIGURE 2.



FIGURE 3.

2). The patient is then raised to a sitting position and requested to snuff up the nose and expectorate the surplus solution (fig. 3). Any general practitioner could learn this technique in a few days.

To date we have used this method on a series of patients from three years to thirty-five years of age. Our experience with these patients may be summarized as follows:

The average length of time required for the introduction of the solution was one minute and ten seconds. No discomfort was experienced by the patient. An assistant to hold the head was required only in those children under seven years of age and a few others who were apprehensive. There was no evidence, such as nasal bleeding, to suggest any injury to the nasal mucosa.

Anosmia followed immediately after the injection in 100 per cent. of cases and persisted for at least five days. Headache followed in every case and persisted for from two to six hours—more severe in patients over twelve years of age. Vomiting followed in one case.

All patients complained of a stuffy nose and a feeling of constriction between the eyes for from six to twelve hours. All cases were symptom-free and apparently well in twelve hours. No case of sinusitis or other complication has been noted to date.

CONCLUSIONS

1. Complete covering of the olfactory area by 1 per cent. zinc sulphate and 1 per cent. Pontocaine in normal saline is followed by immediate anosmia which persists for five days or longer.

2. Complete covering of the olfactory area is not obtained in the majority of patients by either dropping the solution in the nose with the head lowered, or by ordinary spraying.

3. One spraying with the no. 156 DeVilbiss atomizer, tip inserted between the nasal septum and the middle turbinate, does not completely cover the olfactory area in the majority of cases.

4. One injection of 0.5 cc. of solution, using the catheter technique, provides complete covering of the olfactory area.

The flexibility of the olive-tipped catheter prevents possible injury to the mucosa or to the cribiform plate. This might easily occur in an apprehensive child when a rigid steel instrument is inserted between the middle turbinate and the septum. By the use of only 0.5 cc. of solution and avoidance of any positive pressure, the likelihood of the solution entering the sphenoidal sinus is considerably lessened, and little or none of the solution is swallowed.

During the past three months many thousands of children and adults have received the zinc sulphate spray in the hope that as in monkeys it will prove a prophylactic agent in epidemic poliomyelitis. The value of this spray will not be known for some months until the records are complete.

We have shown that the olfactory area was incompletely covered in the majority of these children. The experience gained in this epidemic proves that few children will submit to the spray on three successive days, as recommended by Peet and associates (5). Does the area have to be completely covered to provide protection? This question remains to be answered.

Before a final verdict is given as to the value of zinc sulphate as a chemoprophylactic agent in epidemic poliomyelitis, we suggest that the catheter method of application, which assures complete and safe covering in one application, be given a thorough trial.

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Preventive Paediatrics as seen by the School Medical Officer*

L. P. MACHAFFIE, M.D.

School Medical Officer, Ottawa Public Schools

THE school medical officer in a large urban centre examines and inspects thousands of children each year. He observes these children from the kindergarten on through the grades, from the age of five years to the age of fourteen or even sixteen years—to the period of adolescence. When satisfactory health records are kept and where an intimate contact is maintained with the parents during the whole school period, a complete picture of past and present illnesses and defects is available for information and study. The causes and aftermaths of many illnesses must be apparent to him, as must be also the effect of inadequate care during convalescent periods. His experience with communicable-disease spread and control should indeed be very great. He must be impressed by the futility of many of the procedures adopted to control communicable disease and the great utility of others. He must have gained a great insight into child psychology and mental health problems. He is bound to be impressed by the many great difficulties to be overcome if the great prevalence of malnutrition in school children is to be conquered. He may be inclined to take a very pessimistic view of physical defects and of various unhealthful conditions encountered, especially when there are inadequate corrective facilities or when parental apathy or ignorance prevents the employment of the already existing correcting agencies.

The school medical officer should realize that Utopian dreams are, after all, only dreams and that no group of public health authorities dealing with school children can hope by any effort expended, no matter how great, to bring all school children to a state of ideal health. Existing conditions of overcrowding, lack of health-consciousness in that large group of people on relief or low-wage earners, coupled with inadequate correcting agencies, place a limit on what can be accomplished. However, one shudders to think what an appalling number of uncorrected defects might exist in our school population if there was no such thing as medical inspection in schools. Perusals of annual reports of school health services definitely indicate that the large number of defects corrected each year makes the effort well worth while.

The Function of the School Medical Officer

In my opinion one of the most important roles which should be played by the school medical officer is that of a health educator for the parents as well as the school children. Informal chats with parent groups on pertinent health

*Presented at the Twenty-third Annual Meeting of the Ontario Health Officers Association, Ottawa, June 18, 1937.

problems at frequent intervals are of untold benefit. Especially should these be of benefit during epidemic times, when parents can be informed of the value of the recognized methods of immunization, of the early signs and symptoms of communicable disease, of the importance of keeping sick children at home from school on the slightest indication of early symptoms of measles, whooping cough, etc., and of the very great necessity of isolating the baby and if possible the toddler from the non-immune brothers and sisters who presumably might develop these diseases. Scarlet fever of recent years has frequently been such a mild disease that children may be sent to school with slight sore throats and rashes. If the extreme mildness of the symptoms were known to parents they might be more on their guard and the persistency of epidemics might be curtailed. Total disregard of quarantine by many parents, and utter disregard of the possible seriousness of whooping cough are especial factors which should be combated. Our medical confreres, too, so many times are inclined to treat communicable disease other than scarlet fever as of no great concern. If they realized that the mortality from whooping cough in the preschool child is much greater than that due to the combined causes of scarlet fever and measles and greater than that due to diphtheria, their attitude might not be so complacent. The school medical officer should also offer guidance to the teachers in making available and helping to select health teaching material.

THE PRESCHOOL CHILD

I am convinced, as the result of several years' examinations of thousands of school children, that a great many children enter school saddled with defects which should never have developed if adequate attention and supervision had been given during the preschool period. The most frequently neglected defects are strabismus, enlarged tonsils and adenoids, discharging ears, deafness, dental defects, flat feet, poor posture, juvenile goitre, and malnutrition. I have called the preschool child "the forgotten child". The reasons why this child is sometimes forgotten or neglected are manifold. All too frequently he is allowed, to a greater or a lesser degree, to adopt the same hours of sleep, the same diet and the same general habits of living as the parents and older children in the family; that is, there is a lack of parental control. How many mothers are there who feel, once the period of meticulous care in the first and part of the second year has passed, that careful guidance and supervision are unnecessary? I feel that there are far too many. Certain essential health rules must be observed in this period and, if they are not observed, dire consequences may result.

Another reason for pitfalls during this stage of the child's development is the parents' lack of knowledge of vital health considerations and their unfamiliarity with the potential dangers of the apparently benign defects which appear from time to time. Whereas parents realize the importance of frequent periodic health examinations during the first year of life, very few appear to realize that the period following infancy should likewise receive frequent supervision. That all-too-prevalent tendency of waiting to call the doctor until illness develops is regrettable.

Apathy, indifference and ignorance, a triad of prime causes of ill health in the runabout child, must be conquered if we wish children to enter the school in as healthy a condition as that in which they entered the toddler and preschool period. One cannot in fairness, however, blame all these conditions of ill health on such causes, for with many it is entirely a financial question; there is also the problem of inadequate free clinic and hospital facilities.

Dental Defects and Their Solution

The appalling number of dental defects in children three to six years old should cause the deepest concern of all public health workers. This shocking state of affairs would not exist if, from the third year, bi-annual trips were made to the dentist. By the same token there would be a saving of thousands of dollars annually; a greater assurance of sound, permanent teeth; a great decrease in the number of pale, delicate and undernourished children; and there would be more healthy adults. Unfortunately, many poorer people and those on relief are unable to obtain prophylactic dental care and attention to early caries in the preschool child and, to the best of my knowledge, there is no place where they can obtain it free in most cities and towns.

Another point which I like to impress is this: there are many parents in every community who are quite well aware that their children's first teeth are rapidly decaying, who have means, but who consider that dental care at this time is hardly worthy of any thought, unless troublesome toothache should occur. These are the same people who are apt to neglect the baby's first permanent tooth, the 6-year molar. Parental education and adequate corrective agencies should, to a large degree, overcome this.

The Need for Medical and Dental Clinics for the Preschool Child

Preschool medical and dental clinics are very urgently needed in many of our Canadian cities and towns, if we wish the children of the masses to grow up as healthy and as free from handicaps as the children of the more well-to-do classes. These clinics would continue the good work of the baby welfare stations and fill the gap between these and the school health services.

The ideal preschool clinic should offer the following services:

- (1) An annual medical examination, including an examination of the urine, a tuberculin test, and one Wassermann test.
- (2) Advice on health habits and food habits, with the free distribution of literature on these subjects.
- (3) Disposition of defects: Tonsil and adenoid cases, ear conditions, flat feet, strabismus, malnutrition, etc., referred to hospital clinics for treatment. Tuberculin reactors referred to the proper local authority, and positive Wassermann cases similarly referred to the proper authority.
- (4) Preventive services: These should include vaccination against smallpox before admission to school; diphtheria toxoid if it has not been given previously; and any of the newer methods of immunization which are at present on trial and which may later prove to be effective measures.

The ideal preschool dental clinic should offer a bi-annual dental examination for children 3 to 5 years old and, ideally, should be equipped to treat early dental

caries. It should also provide personal instruction in dental hygiene and the free distribution of brief and pertinent literature.

THE SCHOOL CHILD

I should like to make some personal observations on certain defects encountered in school pupils, not necessarily the result of preschool neglect.

Malnutrition

My observations lead me to believe that great numbers of school children are inadequately nourished. My conclusions have not been solely the result of analyzing growth and weight charts of 10,000 pupils annually for six years—but average height and weight data for age, along with growth and weight trends, offer most useful yardsticks. My opinions are principally based on the physical examination and the reaction to environment of the child. The classical signs and symptoms, such as fatigue, poor posture, pallor, nervous excitability or, conversely, mental torpor, also irritability, fractiousness, the “fidgets”, “tired circles” around the eyes and absence of the normal, bright, healthy, happy looking, ruddy facies are by far the most reliable indications. I am not in agreement with some authorities that malnutrition is as common among the well-to-do as it is among the poorer classes. It is true that there are many exceptions: the “only” child, who has been pampered and catered to all his life is sure to be unhealthy, and now and again one sees vigorous, robust, healthy children in the lowest stratum of society. I am definitely of the opinion, also, that physical defects are not the principal causes of malnutrition. It has been particularly easy to observe this in our Ottawa schools for in some of our schools the greatest proportion of the pupils come from families who are on relief or who are very low wage earners with large families living in crowded quarters. In other schools, 75 per cent. of the pupils come from the families of the more fortunate classes, professional men, business men, civil servants, etc.

What, then, is the solution of this problem of malnutrition? I feel that very little headway can be made as long as the former class continues to have such large families, is unable to obtain an adequate living allowance, and is forced to live in crowded insanitary quarters. All our health teaching in the schools will undoubtedly do some good among this class, but how can we expect each child to drink one quart of milk a day, discontinuing tea and coffee, when there is very little milk in the home to drink? How can we expect them to go to bed early or sleep alone with the window wide open? The noise and confusion of the crowded house are not conducive to abundance of sleep, and the window cannot be opened because of insufficient bed covers and insufficient fuel. In my opinion, insufficient milk and insufficient rest and overcrowding are the greatest causes of malnutrition.

In any consideration of malnutrition one should not include healthy children of the linear type, even though they are 15 per cent. under the average weight. One must also realize that many undernourished children are allergic and that no amount of effort will correct the condition. One wonders, too, how frequently congenital syphilis may be responsible. Children who suffer from coeliac disease in the toddler and preschool period seldom completely recover; during the school

age their digestion is sufficiently abnormal to prevent normal nutrition. Then, too, especially in the well-to-do, factors such as inadequate parental control and understanding, and discord and unhappiness in the home, may be prime causes.

Poor Posture

A great deal has been written about poor posture. Unquestionably, the erect child or adult is a rare species, for erect posture is difficult to obtain and maintain. I feel that it never will be obtained in all our school pupils unless ideal care can be directed to the child in the period of infancy and the preschool period. Granted these prerequisites, then, provided there are good health, correct food and living habits, freedom from defects and absolute freedom from chronic fatigue, during the school period, a great many children would, I think, stand erect, but I question whether the majority would unless physical culture of the mass type used in Sweden, Italy and other European countries became part of the training of our school child. Undoubtedly, too, heredity is a great controlling factor.

Defective Vision and Eye Strain

School authorities find that from 15 to 20 per cent. of school pupils suffer from some eye defect or symptoms referable to that organ. I am quite in agreement with these figures. I have visited several schools in different towns and cities, and in doing so have taken particular notice of the lighting facilities. These observations, along with deductions from various articles appearing from time to time in medical and school journals, convince me that defective school lighting must to a great degree be responsible for visual disturbances. The quality and the quantity of the light and the type of artificial lighting-fixtures are factors that should receive the most careful consideration and study by school health services and boards of education. Each school should be equipped with a light meter, so that the quantity of light in each classroom could be measured under varying conditions of natural light at various times of the year and hours of the day. Such a procedure would show that even under ideal conditions during the brightest of days in June and September in many of the older schools, the two or three rows of desks farthest from the window have much less than 10 footcandles of light which is considered a minimum, although this to me seems wholly inadequate for close work. Many blackboards too, under similar conditions, may show 10 footcandles only on the central panel of the front board. In most classrooms, anything less than six 200-watt bulbs in indirect or direct-indirect lighting fixtures does not meet the demand. The artificial lighting should be so arranged that the two or three lights farthest from the window can be switched on during darker days without the added expense of switching on the unnecessary lights near the window. Glare, direct or indirect, or poor quality of light should be vigorously combated by proper attention to the boards and by the judicious use of blinds of the venetian type. By far the best arrangement of blinds is to have two hung at the centre of the window so that there may be independent control of sunlight entering through either sash.

Tonsils

How many illnesses of middle life are attributed to focal infection from bad teeth or bad tonsils? How frequently is tonsil removal advocated at this period, after the damage has been done? If tonsils are such a menace to adult life—and we know they are to child life—why not as a prophylactic measure have 90 per cent. of them removed in early childhood? This may appear to be a far too radical procedure. We do know, however, that a healthy-looking tonsil is a curiosity in childhood and that at whatever age they are removed haemolytic streptococci may be found in their substance and that many times pockets of pus are found in apparently innocent-looking tonsils. If focal infections were removed at their earliest appearance, or potential sources of focal infection were removed in early childhood or at the adolescent age, how many cases of duodenal ulcer, chronic arthritis, cholecystitis, anaemia, coronary heart disease, etc., would be avoided in later years? Why wait until the damage is done?

Communicable Disease Spread and Control in the School

My personal feeling in respect of communicable disease in urban districts is that health authorities can do very little in the school to prevent the spread of measles, German measles, mumps, chicken pox, and possibly whooping cough. If the pupils of each classroom in every school, during epidemics, were inspected each morning by a physician or a nurse who was expert in detecting these diseases in their very earliest stages, there might be some lessening of contagion if suspects were excluded; this, however, is impracticable. When one realizes that children mingle intimately out of school where there is no supervision, the futility of expending too much time in classroom inspections for other than the detection of scarlet fever carriers or suspected mild cases of scarlet fever must be apparent to all. Nevertheless, occasional classroom inspections must be made by the nurse during epidemic times in order to prevent children suffering from communicable disease from sitting in the class and in order to encourage the teacher to assume a greater measure of responsibility in this respect.

Health authorities should concentrate their effort against diphtheria, scarlet fever, whooping cough and smallpox by education, immunization, rigid enforcement of quarantine, and searching classroom inspections for scarlet fever carriers by school health services. Futile procedures such as fumigation of classrooms and schools should be discontinued. The co-operation and understanding of the public can never be obtained until they are made to realize that "man is the reservoir of his own infection".

I am very much in favour of the shortest possible quarantine for cases of mumps because I question if any but the most rigid and prolonged isolation of contacts and actual cases is of any value in curtailing an epidemic. As mumps is such a mild disease in most cases, I can sympathize with parents and educators who object, and rightly so, to long quarantine periods for the sick child; the futility is obvious to all. I concur with those who claim that contagion may occur one or two days before the swelling is evident and, as in measles, whooping

cough and German measles, the damage may be done before the source of contagion can be removed.

The Physical Examination

One final word: about the complete physical examination as performed by the school medical officer. In the majority of instances this examination reveals very little more than does an inspection and examination of the ears, nose, throat, mouth, vision and general appearance. It is true that one may discover certain heart conditions, but these could be quite as easily detected by slipping the flat type of stethoscope under the clothing. School health service rooms are too noisy to permit of satisfactory percussion, and the stethoscope does not reveal childhood tuberculosis except in certain marked cases, and then it may only be suspected. The adult type of tuberculosis is not encountered in children of the elementary schools. Tuberculin tests and x-rays have supplanted the stethoscope in the detection of pulmonary tuberculosis. Where funds are available, no one questions the great value of testing all adolescent school children, with x-ray examination of the reactors. Our search for pulmonary tuberculosis should be confined to secondary school pupils.

Urine Examination

One very important test should be performed if we are to call these examinations complete; viz., urine examination. Pyelitis, diabetes, and albuminuria have many times been encountered in urine examinations by our Ottawa Public School health services. This test should, ideally, be done as a routine but health service staffs are not large enough to permit this. We attempt to test for sugar, albumin and pus in all pale children, poor gainers, and those showing severe malnutrition, if we are dealing with children of the so-called "clinic cases" or low wage earners. We feel that the children of the well-to-do will promptly be taken to their own physician, who is usually very willing to carry out our suggestions. We have twenty public schools in Ottawa, and in five of these schools and in the central office we have the necessary equipment for simple urine tests. In my opinion, school medical officers who are too busy looking at teeth, tonsils, etc., to give time for this service, are missing great opportunities to confer benefit to many children and are many times giving ill children a clean bill of health. A note informing a parent that Billy or Johnny is pale or undernourished, except in the well-to-do classes, will very seldom result in a urine examination. I definitely feel that the urine examination in selected cases constitutes a vastly more important examination than a stethoscopic one.

However, a more complete stethoscopic examination should be made in children who are coughing or in those in whom indications of cardiac disease are encountered. I do feel too that at the child's first physical examination, when the parent is present, a complete stripping of the child to the waist has an educational value and is more likely to create an interest on the part of both parent and child.

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NEW PROMISE IN SILICOSIS PREVENTION

INTENSIVE efforts to control silicosis, directed in general toward the reduction of the amount of dust in the air breathed, have been made during the past few years. In Ontario, all men employed underground have been required to undergo careful physical examination each year at one of the centres established for this purpose. Only those who pass this examination are given a certificate to engage as an underground miner. Yet the problem of the prevention of silicosis has remained largely unsolved. It is conservatively estimated that the incidence of this disease is approximately one half of one per cent. among those engaged in mining. When it is remembered that nearly 30,000 are employed underground in Ontario mines and that silicosis is not confined to mining but is present in all industries in which silica dust is present, the extent of the problem is appreciated. Although the true cost of silicosis cannot be expressed in monetary terms, in Ontario a liability in excess of \$5,000,000 for compensation and medical aid since 1926 is sufficient to indicate the burden of silicosis on industry, particularly mining, to-day.

The recent publication of the results of Denny, Robson and Irwin* in experiments conducted at the McIntyre Porcupine Mines in co-operation with the Department of Medical Research, University of Toronto, pointing the way to a possible solution of the problem of the prevention of silicosis, has been received with the greatest interest.

Working on the hypothesis that if the solubility of silicious material retained in the lung could be sufficiently reduced by the addition of some non-toxic element or compound, the usual fibrotic response would be modified, Mr. Denny, who is the engineer in charge of metallurgical problems, and Dr. Robson, chief surgeon of the McIntyre Mine, investigated a number of possible compounds. The work was commenced in November 1932, but it was not until March 1936 that the discovery was made that the presence of small amounts of metallic aluminum almost completely prevented silicious material from passing

*Prevention of Silicosis by Metallic Aluminum, *Canad. M.A.J.*, 1937, 37:1.

into solution. Practical trial of this method was made by exposing a group of rabbits to fine, freshly-ground, uncontaminated quartz dust over a period of six months. One group of rabbits was exposed to quartz dust alone, while a second group was exposed to quartz dust to which less than one per cent. of metallic aluminum had been added. At various intervals during this period, the lungs and other organs of animals were sent to Dr. Irwin in the Department of Medical Research in the University of Toronto for pathological examination. On sectioning it was reported that all the controls showed a picture from early to well-established silicosis depending on the length of exposure. The animals subjected to silica dust containing metallic aluminum showed either minimal or no fibrosis of the lungs.

The authors further state that no damage was seen in the lungs or other organs that could be attributed to the presence of aluminum. These results show that the fibrotic response was modified in this group of rabbits by the addition of less than one per cent. of metallic aluminum to the quartz dust. Although the number of rabbits used in these experiments was small, preliminary results in a larger group of animals substantiate the findings. In the Department of Medical Research similar experiments are being conducted using rabbits, guinea-pigs, rats, and dogs.

It is generally conceded that the fibrosis in silicosis is the result of chemical reaction and not of the physical presence of the silicious material. The authors are unable at present to state whether the aluminum is acting locally or systemically, or for what period after cessation of exposure to dust containing aluminum it will continue to act. Details of the practical application of this discovery have not been completed, but it would appear that it would be a relatively simple matter to have present the small quantity of metallic aluminum which is desirable. The authors themselves refer to the importance of maintaining efforts directed to the control of dust-rising ventilation, in spite of the interesting and perhaps very useful method of approach to the control of silicosis suggested by their work.

When it is remembered that, on the average, an exposure to silicious material for fifteen years is required for the development of silicosis, it is obvious that the evaluation of the practical value of this method cannot be made quickly. The results, however, in experimental animals are of such promise that, even though the method should not prove to be effective in man, an entirely new chapter has been written in the development of methods of control, and out of the experience the final control of silicosis may be evolved.

REPORTS FROM THE ANNUAL MEETING*

Part IV

FOURTH ANNUAL REPORT OF THE COMMITTEE ON CERTIFICATION OF CAUSES OF DEATH

DURING the fourth year of the Committee's activities, work has been continued in all fields of its interest and responsibility. Special attention is now being directed, however, to the current use of the medical certificate of cause of death. In accordance with a recommendation made in the third annual report of this Committee, the further detailed work on stillbirths which was immediately needed was entrusted to a special subcommittee and the report on this work is presented separately.

The report for the current session is presented in the sections which follow.

SECTION I. THE NEW HANDBOOK ON DEATH REGISTRATION AND CERTIFICATION

During the past year the Dominion Bureau of Statistics formally issued the new "Handbook on Death Registration and Certification", in the preparation of which this Committee assisted. The handbook, designed specially for the medical practitioner, contains a brief review of the history of vital statistics and registration in Canada, notes on the duty of the medical practitioner, undertaker and informant in respect to death registration, and a detailed discussion of the medical certificate itself. In addition a section is devoted to the nature and purpose of the International List of Causes of Death, the full text of the list itself being included. The standard death certificate is reproduced in the handbook. A terse note on stillbirths includes the definition now accepted throughout Canada for the purposes of vital statistics and a statement of the method of registration now in practice. The appendix to this handbook presents some interesting information concerning the Model Bill, the fundamental principles of registration and the value of birth and death registration.

This handbook will in itself be of substantial value in teaching medical students the principles of medical certification and in interesting them in the classification of diseases and causes of death. As well, it should prove of value in assisting practising physicians to gain a more complete understanding of vital statistics. The Committee expresses its appreciation to Dr. Coats, Dominion Statistician, not only for making this new publication available but also for providing copies for the teaching departments of hygiene and preventive medicine in the faculties of medicine of the various universities.

SECTION II. FURTHER PLANS TO ADVANCE THE TEACHING OF VITAL STATISTICS

Recognizing that many medical students in past years have graduated with little or no conception of what the objective of the medical statement is or what

*Presented at the Twenty-sixth Annual Meeting of the Canadian Public Health Association, Ottawa, June, 1937.

is meant by "cause of death" for the purposes of medical mortality records, the Committee drafted a practical exercise which, it was hoped, might be of service in the instruction of medical students in the various universities. Two practical trials, each with 150 students, have been made and the exercises reviewed. The results of this experiment, in which the students were asked to fill in the medical certificate of cause of death from abstracts of the clinical histories of a group of patients dying in hospital, clearly demonstrated the need.

Common Errors in the Use of the Medical Certificate by Medical Students

1. Failure to observe the request for conciseness, making the medical statement virtually an abstract of the clinical history and pathological findings. This tendency to find a place for all clinical facts leads to such statements as "uraemia" due to "chronic nephritis" due to "generalized arteriosclerosis with hypertension".
2. Entry of terminal events such as oedema of lungs, etc., which are not necessary and, in fact, undesirable.
3. Reversal of the order of statement, viz., "cellulitis" due to "septicaemia"; "carcinoma of stomach" due to "bronchopneumonia"; etc.
4. Entering statements under section II which are causally related to Immediate Cause, e.g., "auricular fibrillation" in a death from "chronic rheumatic carditis", and "tuberculosis of kidney" in a death from "generalized tuberculosis", "secondary carcinoma of various organs" in a death from cancer of a specified primary site, or "gangrene of limb" resulting from "arteriosclerosis".
5. Proceeding too far backwards, e.g., "chronic nephritis" due to "arteriosclerosis" or "diabetes" due to "arteriosclerosis", and "chronic rheumatic carditis" due to "acute rheumatic fever".
6. More than one statement on one line, e.g., "arteriosclerosis" and "chronic nephritis". This is an unfortunate practice, since it leaves the certifier's viewpoint completely in doubt.
7. Unreasonable order of statement in section I, e.g., "chronic myocarditis" due to "diabetes mellitus" due to "chronic cystitis".
8. Entering under section I morbid conditions which are *unrelated* to Immediate Cause, when this section is reserved only for conditions which are *related* to each other.

The Committee believes that this summary may serve to assist in the education of medical students elsewhere, and further that the attention of medical practitioners should be directed in a suitable way to these common errors which are made in certifying causes of death.

Copies of the exercise were supplied for trial in the instruction of students in three universities. It is gratifying that as a result the exercise is being adopted as part of the instruction and it is hoped that it will be in use next year in the other universities also. The value of such efforts of the Section is recognized and, if continued over a period of years, medical certification should be greatly improved. The value also of the Handbook on Death Registration and Certification, recently distributed by the Dominion Bureau of Statistics, needs no emphasis.

SECTION III. REGISTRATION FOR MEDICAL CERTIFICATION OF STILLBIRTHS

In accordance with a recommendation made in the third report of this Committee, a special subcommittee has been entrusted with this phase of the work, and the report thereon is presented separately.*

*The report of this subcommittee will be published in the November issue.

SECTION IV. CONFIDENTIAL DEATH CERTIFICATION

A recommendation was made by this Committee in its third report that a special subcommittee undertake a further detailed study of the problem of confidential death certification. A report will be presented at a later date on the findings of this group. Meanwhile, the Committee reports progress in investigating the problem.

SECTION V. FURTHER EXPERIENCE WITH THE NEW MEDICAL CERTIFICATE OF CAUSE OF DEATH

In continuing its policy of following developments in respect to the use of the new medical certificate by physicians, the Committee again undertook to study a sample of death certificates. This sample was, as before, taken in Toronto and covered the months of March and April, 1937. The objective of this review was to secure further information concerning any changes in the use of the medical questions relating to cause of death since the first sample was taken in May-August, 1935. From the full sample of 1350 certificates, 49 stillbirths and 321 "old" certificates were excluded, leaving 980 for analysis. In making this analysis, the Committee was also interested in (1) data which would further indicate the direction in which education should be offered to medical practitioners, and (2) any further information bearing on the possible influence of duration, if such were added.

The medical statements of cause of death were classified into the four main categories used when the first sample was reviewed (see Third Report of the Committee on the Certification of Causes of Death, page 34, Annual Report, 1936). Group I contains those certificates on which a single cause only was recorded, group II contains certificates on which multiple causes were stated in

TABLE I
FURTHER ANALYSIS OF THE USE OF THE NEW MEDICAL CERTIFICATE IN TORONTO*

	Toronto(1)		(Toronto(2)		England & Wales(3)	
	Number	Per cent.	Number	Per cent.	Number	Per cent.
Single entry.....	110	12.2	274	28.0	5637	57.0
Multiple entry in reasonable order and without ambiguity.....	548	61.1	504	51.4	4001	40.5
Inverted entry†.....	240	26.7	172	17.5	107	1.1
Double entry‡.....			30	3.1	147	1.5
	898	100.0	980	100.0	9892	100.0

*Sample excludes stillbirths.

(1) Sample taken May-August, 1935, six months after introduction of the new form.

(2) Sample taken March-April, 1937, twenty-five months after introduction of the new form.

(3) Sample taken March, 1935, after eight years' experience with the new certificate (after Stocks).

†Multiple causes entered without regard to the requirement of the form and therefore obscuring the physician's viewpoint.

‡Two cases or more stated on one line and therefore ambiguous.

a clear and reasonable order, group III comprises "inverted" entries (multiple causes entered without regard to the requirement of the form and therefore obscuring the physician's viewpoint), while group IV consists of those certificates in which a double entry was made (two causes or more on one line).

A summary of the findings of the Committee on the above basis is given in table I. English data are included for comparison.

The Committee is of the opinion that any improvement in experience with the medical certificate of cause of death in the city of Toronto is equally likely to be occurring elsewhere in Canada. Therefore the very definite improvement manifested by the figures in table I since the first sample was taken in 1935 is a source of considerable interest and bears out the forecast made by the Committee in its last report that "there will undoubtedly be substantial improvement in certification in the next few years." Of particular interest in the table is the marked increase in the number of instances in which a single entry only appeared on the certificate. On the other hand, the relatively large number of instances in which a "double" or "inverted" entry is still being made indicates the need for further educational effort. The Committee believes that over the next five years considerable reduction will in all likelihood be effected in the number of medical statements falling into these latter categories. Further detail in respect to the unsatisfactory medical certificates classified in this sample is given in table II.

TABLE II
ANALYSIS OF UNSATISFACTORY MEDICAL CERTIFICATES
TORONTO SAMPLE, 1935 AND 1937

Type of Entry	1935	1937
Incorrect order under I	54	32(4)
Misplaced causes under I	69	27(9)
Misplaced causes under II	48	77(10)
Reversal of order under I	45	37(19)
Double entry (two causes in one space)	24	30(15)
	240(50)	202(57)

The figures in brackets indicate the number of cases which could *not* be readily classified according to the present practice by careful consideration of each form, because the opinion of the physician or the nature of these case was not clear. This number, 57 or 5.7 per cent. in 1937, is relatively small. It is true, of course, that most of these unsatisfactory certificates could be classified fairly easily by the use of the rules of choice now in vogue, but the physician's opinion which the certificate is designed to secure is completely obscured from the statistician in these cases. From this viewpoint such returns are most unsatisfactory.

One further point of interest in reviewing these certificates was the fact that in a great many cases far too much detail was recorded in the medical statement of cause of death. The Committee believes that this is the result of a misconception on the part of the medical profession as to what a medical certificate of cause of death purposes to be. Fifty-two certificates were selected in which physicians had "proceeded too far backwards" in their statements in

section I of the form, or had recorded much unnecessary detail, the tendency apparently being to regard the certificate as an abstract of a clinical history rather than as a concise scientific statement of the underlying cause of death for the purpose of medical records.

In a number of cases the Committee noted also that although it was indicated that an autopsy had been performed, available autopsy information was not recorded in the medical statement but was subsequently secured by correspondence. This suggests the desirability of revising the question dealing with autopsy to read "If an autopsy was done state findings" or adding to the present certificate an additional question "State findings".

In respect to the need for duration, the Committee once again reaffirms its opinion that duration should not be included on the medical certificate particularly since it is used merely to assist in making decisions when the medical certificate is unsatisfactory. From the sample reviewed by the Committee it would appear that only about one per cent. of all deaths might be classified more readily if information concerning duration were available. In only two cases in the whole sample did the record of a communicable disease contracted at an earlier date leave the cases in doubt as to classification, and the Committee believes that such cases may at the moment, in view of their infrequency, be handled by supplementary correspondence with physicians. The Committee, however, will be interested in the findings noted following the revision in the medical certificate of causes of death undertaken by the province of Quebec. The change, which was made a year ago, was to add a third section to the medical certificate reading as follows: "If a communicable disease is mentioned on this certificate, give (a) date of appearance, (b) duration of disease."

It is again pointed out, however, that in just those cases in which the principal difficulty arises (due principally to faulty certifying practice) duration might not be given, and if given would be less likely to be reliable. Furthermore, the ultimate objective of the new certificate is undoubtedly to place, in so far as possible, the burden of indicating the cause of death for classification on the physician and not on the statistician. The difficulties which are being experienced now (certainly no more frequent than heretofore) arise chiefly from conflict in the application of rules of choice where joint causes are stated. It must be remembered, however, that these rules arose only to guide the statistician largely *because physicians did not return scientific statements in a uniform fashion*. The present tendency on the part of the physician to question the validity of statistics concerning causes of death may be traced directly to the practice of applying rules-of-thumb in statistical classification which are at present necessary. The practice is quite unscientific and from the medical point of view distorts the facts, making the records in some instances records of the *incidence* of diseases among the population at death rather than *causes of death*.

However, the Committee urges all vital statistics bureaus to carry on their usual practice with the new form, to continue to request additional data where needed as in the past and to apply the same principles as with the old certificate except of course when the orderly arrangement of relationship clearly contra-

indicates such practice. Care should be taken to retain the procedures followed earlier until the time presents itself, as it undoubtedly will, when rules of choice may be dispensed with entirely, except in a few cases, and when the certifying doctor's opinion as expressed on the form may be accepted as cause of death. When this time arrives it will be necessary to consider the advisability of coding according to both old and new practice, so that the precise influence of the change may be noted. There is no doubt that cancer and diabetes would be two diseases whose toll would show a significant decline under a scheme whereby the physician's opinion as indicated on the certificate would be accepted.

The Committee therefore feels that rules of choice should be retained and uniformly applied (except where specifically contraindicated) at least until 1945, and that at this time a detailed study be made of a large sample of medical certificates to determine whether or not rules of preference can yet be dispensed with.

The Committee recommends further that meanwhile samples continue to be taken at intervals in order to follow developments in certifying practice.

SECTION VI. FURTHER REPORT AND RECOMMENDATIONS CONCERNING THE REVISION OF THE INTERNATIONAL LIST OF CAUSES OF DEATH

In its third report the Committee on the Certification of Causes of Death presented in detail its recommendations for the revision of the International List. A special subcommittee, however, was appointed to deal further with the classification of rheumatic fever and its various manifestations. This special subcommittee comprised Dr. E. Gagnon (Chairman), Dr. Paul Parrot, Dr. N. E. McKinnon, and Dr. A. H. Sellers (Secretary). For convenience the report of this group is herewith incorporated along with certain other more general recommendations concerning Canadian practice particularly.

The Subcommittee reaffirms the opinion of the whole Committee as set forth in the third annual report in the section dealing with the revision of the International List of Causes of Death, namely, that there is real practical need for provision in the List whereby all deaths from acute rheumatic fever, rheumatic heart disease and other forms or manifestations of rheumatic fever, might be obtainable readily. It is believed that consideration should be given to the parent Committee's original recommendations on this point in its third annual report. This Subcommittee suggests, however, that in order to avoid any break in the secular comparability of records of cardiac mortality, the same purpose can be achieved by the provision of subtitles under the appropriate rubrics, viz., 87, 92 and 95.

This procedure opens up the whole question of cross-classification. For instance, the scheme could readily be carried further in order to demonstrate frequent morbid associations in deaths attributed to chronic nephritis. Thus rubric 131 could be subdivided into various headings as "131 (a), chronic nephritis associated with rheumatic heart disease", and so on. For detailed study such a scheme has merit, but since rules of choice are now being used

for the selection of a single cause of death for tabulation, and since whatever scheme is used, a record of one cause only is feasible at the moment, the Committee suggests that the objective in mind respecting rheumatic fever can be achieved by providing appropriate subtitles for those headings under which rheumatic heart disease or other manifestations of rheumatic fever are actually recorded as the cause of death for statistical purposes. Under present practice data on these deaths are not obtainable separately from heart lesions of other origin.

Additional Recommendations relating to Canadian Practice

The Committee gave further thought to certain other aspects of the International List as it relates to Canadian practice.

(1) That Canadian practice in respect of deaths from dysentery be modified, title 13, Dysentery, being divided into (a) Amoebic, (b) Bacillary, and (c) Other and unspecified. This is already the practice in the United States and in England and Wales. It is, furthermore, a practical step which will add considerable value to the meaning of data compiled under title 13. Its present heterogeneous character leaves much to be desired.

(2) That title 78, Encephalitis (non-epidemic), be subdivided (as was the practice following the third revision of the International List) into (a) Cerebral Abscess, and (b) Encephalitis not specified as epidemic and others under this title. This was the recommendation at the fourth decennial revision and has been the practice in England and Wales since that time.

In concluding this report I wish, as Chairman, to make special reference to the service rendered to the Committee by Dr. A. H. Sellers who, as Secretary to this Committee and as Chairman of the Committee on Stillbirths, has conducted the extensive studies on which the reports have been based. Without such studies and Dr. Sellers' keen interest and insight the Committee would not have been able to publish the reports in their present form.

DR. R. D. DEFRIES, *Chairman*; DR. H. E. YOUNG, MR. E. S. MACPHAIL, DR. M. R. BOW, DR. WM. WARWICK, DR. PAUL PARROT, MR. S. J. MANCHESTER, MR. T. E. ASHTON, DR. E. GAGNON, and DR. A. H. SELLERS, *Secretary*.

SIXTH ANNUAL REPORT OF THE COMMITTEE ON
NON-RESIDENT BIRTHS AND DEATHS

IN the endeavour to establish a practicable system for the re-allocation of births and deaths by residence as well as by place of occurrence, the committee following its appointment in 1931 realized that within certain limitations definite objectives might be attained. These were outlined in the first report presented to the Section of Vital Statistics in 1932, the majority of which have since been achieved. The final step undertaken by the committee about a year ago was that of securing an expression of opinion from the nine

provincial bureaux as to the feasibility and extent to which a mutual inter- and intra-provincial system of supplying copies of certificates could possibly be employed. In a statement covering in detail the activities and accomplishments of the committee, the following two questions were submitted to each province for reply and comment:

- (1) Would the provincial department be willing to co-operate in a scheme for the interchange of copies of birth and death certificates of non-residents occurring in the province?
- (2) Would it be possible for the department to forward, at monthly intervals, to those municipal offices which so desire, copies of birth and death certificates of their residents occurring elsewhere in the province?

Since the last meeting of the Section in Vancouver, complete replies have been received which seem to indicate that a very encouraging situation exists among the representatives of each province. With reference to the first question all were unanimous in expressing a willingness to co-operate, and in reply to the second the response was practically unanimous with one exception being taken on account of the extra amount of work involved.

The first-mentioned procedure is now in effect in at least two provinces. In three, certain municipalities are being supplied with information essential to the correction of their rates for the factor of residence. At the present time re-allocation is being made in three provinces with resident rates for cities included in their annual reports. Further advances in this direction have been brought to the attention of the committee during the past year. On the strength of the foregoing facts the committee is led to believe that, as circumstances permit the introduction of the scheme, this new basis will eventually be adopted by all provinces.

Since the appointment of this committee definite rules regarding residence have been drafted by the Dominion Bureau of Statistics and are now available. Moreover, the Bureau recently advised the members of the committee that the first routine report of deaths by residence for the year 1935 is at present in the process of printing.

In view of the provincial bureaux having expressed their desire to co-operate in every way possible, there appears little to be done other than recommend to each the standards of procedure adopted by the Dominion Bureau of Statistics. In this connection a resolution is appended herewith which the committee submits for the consideration of the members of the Section.

In conclusion, it is felt that the committee has now served its purpose in this undertaking and asks to be dissolved. At this time sincere appreciation is expressed to the Dominion Bureau of Statistics for the enormous amount of time expended on special studies of the problem and invaluable co-operation since the appointment of this committee in 1931.

T. E. ASHTON, *Chairman*; W. R. TRACEY, GRANT FLEMING, M.D.,
D. V. CURREY, M.D., PAUL PARROT, M.D.

RESOLUTION

WHEREAS in the opinion of this Section the value of vital statistics would be greatly enhanced if births and deaths were compiled on the basis of residence as well as by place of occurrence,

AND WHEREAS the Dominion Bureau of Statistics has established re-allocation by residence as a routine measure and the available standards of procedure in connection therewith have been adopted by this Section,

AND WHEREAS a statement setting forth the work and recommendations of the committee has been forwarded to the nine provincial bureaux and in reply to a questionnaire they have expressed their willingness to co-operate in the scheme set forth in the statement,

AND WHEREAS the Section of Vital Statistics and Epidemiology concur in the procedure recommended and which is being carried out in at least three provinces at the present time,—

BE IT RESOLVED that the Dominion Bureau of Statistics be requested to prepare a suitable memorandum respecting the re-allocation of births and deaths by residence and forward a copy of same to each province,

AND BE IT RESOLVED further that a copy of this resolution be forwarded to each province, together with the request to proceed as early as possible in supplying copies of certificates of births and deaths to the province in which the deceased person, or the mother in case of birth, had fixed residence or usual place of abode, and that every effort be made to supply municipalities who desire it, either by copies of certificates or in some other satisfactory manner, the information essential to the compilation of their vital statistics on the basis of residence.

LETTER FROM GREAT BRITAIN

GEORGE F. BUCHAN, M.D., F.R.C.P., D.P.H.

London

MATERNITY AND CHILD WELFARE CONFERENCE

SUMMER is the season for public health conferences in Great Britain. The first one of importance which took place this year was the English Speaking Conference on Maternity and Child Welfare in London in the first four days of June. This was held a month earlier than usual in order that Coronation visitors might participate, and one of the features of the meeting was the large number of overseas representatives who attended. These included three Ministers of Health or their deputies and representatives of twenty-two Governments. Among the former was Dr. R. E. Wodehouse of Canada who presided in a brilliantly successful manner over one of the sessions and was a welcome guest at the Coronation dinner of the Maternity and Child Welfare Group of the Society of Medical Officers of Health which co-operates in the organization of the conference. Other notable visitors who presided at the several sessions were Dame Enid Lyons, wife of the Prime Minister of Australia, Dr. Gaha, Minister of Tasmania and Dr. Josephine Baker representing the United States of America. Festivities connected with the conference were a reception at Lancaster House by the British Government, one by the College of Nursing and an evening river trip down the Thames.

The principal subjects discussed were—The Promotion of Maternity and Child Welfare in Backward and Rural Areas; Progressive Legislation in connection with Maternity and Child Welfare; The Education of Parents in the Care of their Children; Nutritional Problems; and The Future of Preventive Psychology in Relation to the Parent and Child. The papers were of excellent standard

and the discussions the more interesting from the fact that they were contributed to by speakers from widely separated parts of the globe. Two new pieces of legislation were much in the minds of those members of the Conference who live and work in this country—the Midwives Act of 1936, which provides for the appointment of salaried midwives by Local Authorities in such numbers that no woman shall be left unprovided for in this respect, and for improvement in their status and conditions of work; and the revised Rules issued by the Central Midwives Board to ensure the better training of midwives and their continued efficiency. Both of these it is hoped will tend to reduce the preventable maternal mortality. Incidentally, the Minister of Health, the Right Honourable Sir Kingsley Wood, M.P., in his Presidential Address at the opening session again reminded his audience that in comparison with other countries England stood next to Holland in respect of its maternal mortality rate, and that recent press campaigns had given our public a wrong impression of the risks of child-bearing. Some of the most interesting papers were by delegates from outlying parts of the Empire where the "promotion of maternity and child welfare" means the overcoming of difficulties that are not even envisaged by those of us who work with up-to-date legislation and equipment and feel cause for grievance if results are not quickly achieved.

THE HEALTH CONGRESS

THE MOST important Congress of the year is the Health Congress of the Royal Sanitary Institute. This year it was held at Birmingham in the second week of July. It was very largely attended by representatives of

local authorities and by workers in public health departments in this country. In addition a large number of delegates from overseas were present.

The Congress dealt with public health in its widest aspect including preventive medicine, town planning, maternity and child welfare, school hygiene, veterinary hygiene, national health insurance, hygiene in industry and tropical hygiene. It was impossible for me to be at all these various sections during the week but those at which I was present were crowded to overflowing. The various discussions were all opened by persons of eminence in public health either in this country or abroad and were extremely interesting and informative.

The high spot of the Congress was the address given by the Minister of Health, the Right Honourable Sir Kingsley Wood, M.P., on the afternoon of Tuesday, July 13th. The Earl of Dudley, the President of the Congress, was in the Chair. In his address the Minister outlined the progress of public health and stated that great as had been the progress, he hoped that more rapid progress would be made in the near future. He therefore proposed to inaugurate during the coming winter a campaign of publicity throughout the country, the keynote of which would be a message to the people to use their local health services. Undoubtedly this campaign, which will be carried out with the characteristic vigour and resource of the Minister, will do a great deal to advance the provision of public health services in this country and promote the public health.

SANITARY INSPECTORS' CONFERENCE

ANOTHER CONFERENCE of outstanding importance is that of the Sanitary Inspectors. This year it was held at Brighton in the first week of September when all previous records were broken with an attendance of 1,562 delegates and repre-

sentatives of the Ministry of Health, Ministry of Agriculture and Fisheries, Local Authorities and kindred Societies and Associations. The meetings were held in the Dome adjoining the Royal Pavilion, that oriental structure erected for King George IV and sold by Queen Victoria to the Brighton Corporation.

Monday was devoted to Association business matters and a reception by his Worship the Mayor and Mayor-ess of Brighton was given to the delegates in the evening. On Tuesday morning the Presidential Address to the Congress was delivered by Sir Leonard Hill, M.B., F.R.S., LL.D. In the afternoon the Public Health Act 1936, the Factories Bill 1937, public cleansing with special reference to salvage and trade refuse were discussed by the Conference. On Thursday the morning session was devoted to questions of meat inspection and the milk supply from the point of view of the consumer. In the afternoon legal and illegal overcrowding and the social aspect of the housing problem were debated. The session on Friday dealt with grit emission which various speakers asserted was on the increase, chiefly due to the use of pulverized fuel and it was generally thought that present legislation was inadequate to prevent this menace to health. A lecture on air raid precautions concluded the proceedings. Delightful weather prevailed throughout the Conference and the representatives left Brighton with many problems to think about and many happy memories of a thoroughly enjoyable and profitable week.

ROYAL SCHOOL FOR DEAF AND DUMB CHILDREN, MARGATE

THE WILLESSEN CORPORATION maintain at this School about 20 children. Accompanied by the Chairman of the Education Committee I paid a visit to the School this summer. There are in all something like 370 children in residence and these are sent by various authorities from many parts of the country.

The School was founded in 1792 in London and since its removal to Margate has continued to grow until now it is the foremost in this country. The recent addition of new classrooms and a new gymnasium indicates its continued expansion.

The congenitally deaf are accepted from the age of three years and receive in addition to speech training that personal mothering so essential to the welfare of the child of tender years. Those children who commence school earlier than five years eventually acquire more perfect speech than those who miss this early tuition and the authorities offer financial assistance to parents to encourage the admission of children below five years.

The special amplifying apparatus designed by Ewing and Littler at Manchester University is used in class teaching and each child is provided with head-phones of crystal high frequency, moving coil or compensated design according to his defect. Multi-tone and radio receivers are not used empirically but careful audiometer tests are made on each child to determine the intensity of sound at each pitch necessary to reach the threshold of perception. After testing the child is taught to adjust the ear-phones so as to derive the maximum benefit. It is found that auditory perception as tested by the audiometer tends to improve rather than regress after the use of amplification but no claims as to the curative value of amplification are made.

The academic staff consists of eight men and eighteen women all specially trained in teaching the deaf and each of the eight industrial departments is controlled by a skilled technical officer conversant with the management of deaf children. The magazine published each term and printed by the boys on the school press tells of success achieved by old students many of whom are now not only self-supporting citizens but employers of others afflicted like themselves.

The domestic and medical care of the pupils is complete and the school is pre-eminent in teaching those afflicted by deafness to play their part as useful individuals in society. It is well worth a visit to anyone interested in the training of the deaf.

ANNUAL REPORT OF THE CHIEF INSPECTOR OF FACTORIES AND WORKSHOPS, 1936

THE ANNUAL REPORT of the Chief Inspector of Factories and Workshops is essentially a report on the measures taken to ameliorate the conditions under which manual labour is performed and is a dissertation on one aspect of the public health of this circumscribed group of workers.

One gains the impression that the work of inspection and correction has been directed to the eradication of present evils in anticipation of the operation of the new Factories Bill which has now received the Royal Assent.

An increase of 18 per cent. in the number of accidents is due in part to an increased percentage of the population in employment but other factors which must have influenced the total are the speeding up of processes by increased mechanization and an influx into industry of persons who, by reason of long inactivity, have lost, temporarily, some of their alertness and skill.

The inspectorate insist on adequate protection for all dangerous machinery but the human element is repeatedly the incriminated agency in accidents and constant education is needed to destroy the old belief that risks are inevitable in certain industrial processes.

In 30 per cent. of accidents to young industrial workers no blame can be apportioned but of the rest the worker and the firm are culpable in approximately an equal number of instances. Training and supervision during the first weeks of working life with selection or rejection for the more dangerous processes could do

no other than reduce the accident rate and are strongly advised.

Industrial poisoning and diseases occupy one section of the Report and in the majority of instances satisfactory reductions are recorded. The cause of the increase of cancer of the nose and lung in nickel refining has merited intensive investigation but no active agent has yet been found

and meanwhile efforts are being made to eliminate every possible contact with the metal, its fumes or dust.

The welfare of workers and general hygiene of factory premises is considered in the latter part of the Report but apart from a steady general improvement, nothing of conspicuous moment is to be noted.

PLANS, PROGRAMS, AND PROGRESS

RECENT INCIDENCE OF POLIOMYELITIS IN CANADA

IN each of the provinces in which poliomyelitis has been prevalent this year a definite decline in the number of reported cases has been noted during the last two weeks of September. In Ontario complete figures, reallocated according to date of onset, are available for the period ending October 2nd. A total of 2,180 cases has been reported. The distribution by weeks is as follows: from January 1st to July 3rd, 4 cases; week ending July 10th, 3 cases; July 17th, 10; July 24th, 14; July 31st, 15; August 7th, 70; August 14th, 89; August 21st, 248; August 28th, 362; September 4th, 413; September 11th, 322; September 18th, 273; September 25th, 239; and October 2nd, 118.

In Toronto also, a definite decline has been noted, although a number of cases are still being reported. The distribution of cases has been as follows: June and July, 6 cases; week ending August 7th, 21; August 14th, 20; August 21st, 68; August 28th, 107; September 4th, 133; September 11th, 102; September 18th, 109; September 25th, 81; and October 2nd, 50, making a total of 697 cases.

It is evident therefore that the peak of the outbreak occurred in the early part of September.

Provision of After-care in Ontario

As far as the Department of Health of Ontario has been able to learn,

there are approximately 450 cases with some degree of paralysis or weakness. To provide adequate after-treatment for these cases the Department has opened a special orthopaedic hospital in Toronto with accommodation for 100 children. The former Grace Hospital, which has been used recently as a nurses' residence, has been made available to the Government by the Toronto Western Hospital for this use. The Department has announced the provision of three weeks' hospital treatment without charge for all cases. During their stay in hospital the children requiring treatment on Bradford frames become accustomed to them and suitable splints are applied as needed. Physicians throughout Ontario have been urged to see that full use is made of the orthopaedic hospital facilities and have been acquainted with the arrangements regarding the supplying of splints. Through the Hospital for Sick Children, Toronto, standardized splints have been developed and with the co-operation of the Ontario Society for Crippled Children it is hoped that every child that has suffered paralysis will receive adequate and prompt treatment. An outstanding contribution has been made by Mr. J. W. H. Bower, Superintendent of the Hospital for Sick Children, in meeting the urgent demand for respirators. Twenty-three "iron lungs" have been constructed and made available for use. The cost of these has been met by the Department of Health of Ontario. It is

probable that at least thirty lives have been saved through the availability of these respirators.

Incidence in Other Provinces

In New Brunswick the total number of cases reported to September 30th was 119. In reporting on this matter the Hon. Dr. William F. Roberts, Minister of Health, stated that further postponement of the opening of schools had been made. Increased incidence has also been reported in Nova Scotia, 46 cases being notified to September 30th. The first case was reported about July 13th. Prince Edward Island has not had any cases this year. Approximately 100 cases have been reported in the city of Montreal, and in the province of Quebec as a whole 140 cases occurred to September 30th. In Western Canada outbreaks of poliomyelitis have occurred in Manitoba and Saskatchewan, and the incidence has been higher also in Alberta. British Columbia appears to be practically free from cases of this disease. To October 2nd the total number of cases reported in Manitoba since January 1st is 230, of which 222 have occurred since June 1st; in Alberta, 121; and in Saskatchewan, 314.

SIXTH ANNUAL MEETING, LABORATORY SECTION

THE WIDESPREAD interest in the Christmas meeting of the Laboratory Section has warranted the committee in enlarging its plans for the forthcoming sixth annual meeting. The meeting will be held on Monday and Tuesday, December 20th and 21st, in the Royal York Hotel, Toronto. Excellent accommodation for the meeting has been provided, permitting of more extensive demonstrations and exhibits. There will be five sessions on Monday and Tuesday, including the dinner and round-table discussion on Monday evening and a luncheon

session on Tuesday. As it has been felt that many of the members would like to spend an additional day in Toronto in visiting the various laboratories, arrangements have been completed for demonstrations in the Department of Health Laboratories, Parliament Buildings; in the Department of Bacteriology and Pathology, Banting Institute; and in the Connaught Laboratories, University of Toronto. There is every promise that the attendance of more than one hundred last year will be considerably exceeded.

Titles of papers for presentation must be submitted before November 15th. Communications regarding the presentation of papers should be addressed to the Chairman of the Section, Dr. A. J. Slack, Institute of Public Health, London; the Vice-chairman, Professor E. G. D. Murray, McGill University, Montreal; or the Secretary, Dr. G. D. W. Cameron, Connaught Laboratories, University of Toronto.

PERSONALS

DR. J. G. FITZGERALD has resumed his responsibilities as Director of the Connaught Laboratories and of the School of Hygiene, University of Toronto, following a year's leave of absence in which, under the auspices of the Rockefeller Foundation, he conducted a study of the teaching of hygiene and preventive medicine in medical colleges of North America and Europe.

THE DEPARTMENT of Pensions and National Health, Ottawa, has announced the following appointments: Chief of the Division of Epidemiology, Dr. R. B. Jenkins, D.P.H., Edmonton, Alta.; Chief of the Division of Child Welfare, Dr. E. Couture, Ottawa; and Chief of the Division of Industrial Hygiene, Dr. Frank G. Pedley, Montreal.

BOOKS AND REPORTS

Materia Medica and Therapeutics.

By Linette A. Parker, B.Sc. (Columbia Univ.), R.N. Sixth Edition. Lea & Febiger, 600 S. Washington Square, Philadelphia, Pa., 1936. 377 pages, illustrated with 32 engravings and 3 plates. Cloth, \$2.50 net.

THIS, the sixth edition of MATERIA MEDICA AND THERAPEUTICS, has been enlarged and revised to conform to the eleventh revision of the United States Pharmacopoeia (1936). There are also some less important changes in the text, such, for example, as the transfer of the discussion of insulin to the section dealing with drugs affecting nutrition.

This book is designed to serve as a textbook for nurses and to this end stress has been laid on the essential and practical points to "an intelligent handling of drugs (but not for prescribing them)". The brief notes on historical developments and legislation serve to enhance the appeal of the text to the nurse.

It may be that the process of simplification of the subject has been carried too far. However, this may be a good fault, for the practice as given is correct and the book is not intended to provide a profound discussion of principles. It is easily understood and the diagrams given are a great aid in explaining the fundamentals of the various therapeutic practices.

A. H. Sellers

Health Guides and Guards.

Francis P. Wall, Assistant Professor and Director of Physical Training, New York University, and Louis D. Zeidberg, M.D., Assistant in Clinical Medicine, College of Medicine, New York University. Prentice-Hall, Inc., 70 Fifth Avenue, New York City, 1936. 208 pages. Price, School \$1.00, Business \$1.35.

HEALTH GUIDES AND GUARDS presents concisely the principles of hygiene. While all body systems are dealt with in order under the headings:

structure, function, disease, and hygiene, almost one-third of the book is devoted to the genital system, social diseases and sex hygiene. This plan is justified merely because it happens to be the aim of the authors to place emphasis on this specific phase of health education at this time. It is not (nor is it intended to be) a balanced manual on hygiene for this reason, and except in so far as it would be designed more particularly for sex education, it could not be considered satisfactory. For instance, tuberculosis occupies only about one page in the text to thirty-four on venereal diseases.

Despite these limitations the book has distinct merit. Indeed, its authors state in the preface that the book is dedicated particularly to airing the facts about venereal diseases freely and frankly. The form of presentation of the material is simple and accessible and the provision of questions on each chapter of the text at the back of the book should be useful in class work. The addition of a glossary would be an improvement.

A. H. Sellers

Cancer and Diet, with Facts and Observations on Related Subjects. Frederick L. Hoffman, LL.D., The Biochemical Research Foundation of the Franklin Institute, Philadelphia. The Williams & Wilkins Company, Mount Royal and Guilford Aves., Baltimore, Md., 1937. 767 pages. \$5.00.

DR. HOFFMAN's many treatises and extensive investigations on cancer have marked him as an important contributor to our knowledge of the natural history of the disease throughout the world. In his latest work, CANCER AND DIET, an imposing volume of over seven hundred pages, he adds still another contribution to the literature on cancer.

The relation (if any) between cancer and diet is a subject of intense controversy. Not only that, but it

is reasonably certain that the antagonists and protagonists have many stormy years ahead of them. Dr. Hoffman has attempted to investigate scientifically this controversial problem. From his experience in the campaign against cancer, from the voluminous literature on the subject, from studies of the dietary customs of native populations, and finally from the detailed study and analysis of some 2,000 case reports of cancer patients in a number of American cities, the author attempts to assess the present status of this disputed theory of the causation of cancer.

The text is presented in four parts: (a) historical development of the conception of diet as a therapeutic factor in cancer; (b) dietary changes in recent years; (c) cancer metabolism; (d) dietary facts concerning cancer patients, including both a discussion of the general facts of a social or medical nature, and specific dietary factors.

Whether we agree with the author or not makes little difference, since no one yet is in a position to give the answer as to whether or not diet is a factor. He, however, is convinced that "profound dietary influences in cancer are to be looked upon as a causative factor, if the constitutional or systemic theory of the disease is to be accepted."

In the first section the author gives an extensive review of the literature particularly from the year 1777 to the present time. Herein, it would appear that there is a tendency to emphasize reports which are favourable to the author's apparently preconceived ideas on the subject; while, on the other hand, there is a tendency to ridicule or minimize the opinions which are opposed. The author points out, indeed, that the first three sections of the book were written before the study presented in the fourth section was begun. This is consistent with the criticism that Dr. Hoffman had made up his mind regarding the part played by diet before he undertook his human experiment.

Despite this criticism, *CANCER AND DIET* should be read by all those in-

terested in the cancer problem, be it only for the provocation which it produces. Dr. Hoffman does not claim to have made an exhaustive study of the literature, but he does attempt to summarize the opinions of many other persons, be it how it may that he has omitted the opinions of many others.

In the final section of the book which deals with the information gathered in his special study by the questionnaire method of a group of living cancerous and non-cancerous persons (special emphasis being on dietary habits), the conclusion is reached that the principal difference between the cancer patient and the controls lies in the quantitative and qualitative richness of the diets of the former. The following excerpts give some highlights from this part of the text:

"I am absolutely convinced that the underlying cause of cancer is to be found in an excessive intake of foods of a high organic or mineral content, or generally of an alkaline base instead of acid. The study emphasises the conclusion that it is not so much a question of any particular type of food product but that all food products seem to be taken in excess, particularly those of high organic content, or energy yielding foods, beyond the needs of body requirements.

"Furthermore, I am convinced, in the light of this study, that the diet should lean toward the acid side of the balance and that dietary specialists should concentrate their attention upon suggestions of a feasible nature not partaking of the nature of faddism more or less impracticable and often harmful. In brief, I have come to the conclusion that the average person in civilised countries eats entirely too much, eats too hurriedly, and often of too hot or too highly spiced foods, or too much modified by processing methods, instead of eating easily digested and easily eliminated natural food substances. The close relation between constipation, indigestion and gastric disorders and cancer is definitely proven by the present study."

In concluding his discussion, Dr. Hoffman says:

"I consider my own duty discharged in presenting the facts as I have found them, which lead to the conclusion that over-nutrition is common in the case of cancer patients to a remarkable and exceptional degree, and that overabundant food consumption unquestionably is the underlying cause of the root condition of cancer in modern life."

A. H. Sellers

